

WRITING AS A COPING MEDIATOR BETWEEN
PSYCHOLOGICAL AND PHYSICAL HEALTH

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WRITING AS A COPING MEDIATOR BETWEEN
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DISSERTATION ABSTRACT

WRITING AS A COPING MEDIATOR BETWEEN
PSYCHOLOGICAL AND PHYSICAL HEALTH

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Individuals who have survived a traumatic event demonstrate vast and numerous resulting psychological and physiological symptoms. After a trauma, the individual utilizes some type of coping technique to deal with the repercussions of the stressful event. The coping strategy that the individual employs following a traumatic event likely influences the resulting outcome. However, the conceptual question of the intervening variable remains. The focus of the current study examines how expressive writing serves

as a coping mediator between a stressful or traumatic experience and the resulting psychological and physiological outcomes.

Ninety-four female prison inmates from a maximum state penitentiary participated in the study. They completed a demographics questionnaire, self-report psychological and physical health questionnaires, and trauma exposure questionnaires. Participants provided heart rate, blood pressure levels, and salivary cortisol levels as well.

Participants wrote for 20 min a day for three consecutive days about a traumatic event or the previous day's events following the protocol established in the expressive writing literature. A seven-week follow-up was conducted with the same measurements.

Participants showed improvements in their mental and physical well-being across time regardless of the writing condition assigned. However, the expected difference between the groups was not demonstrated.

Conclusions can be drawn from the current research that over time writing, regardless of the assigned group, shows psychological and physical benefits to individuals who have endured a traumatic event. In this study, the stress of the environment itself may have been a factor in the lack of significant differences between the groups. The difficulty in processing traumatic memories in an unsafe environment may have influenced the outcome data.

Future studies should categorize the number and severity of the traumatic events and assess for PTSD diagnosis to determine if there are differences in processing the trauma through expressive writing based on trauma level. Examining individuals in the community with similar trauma levels, but without the added current stressor of incarceration, would also be beneficial for determining the effects of writing on trauma.

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Computer software used:

- 1) Statistical Program for the Social Sciences (SPSS), Version 11.0 for Windows.
- 2) Microsoft Office Word 2003 and Microsoft Office Word 2007

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CHAPTER I - INTRODUCTION

Overview

Trauma impacts individuals physically, psychologically, and socially. One possible result of experiencing a traumatic event is the development of posttraumatic stress disorder (PTSD), which is a debilitating psychological disorder with a complicated etiological basis and treatment course. Illustrating such complexity, Koch (2002) viewed PTSD as a condition developing from and being maintained by an individual's appraisals of danger, personal competence, trustworthiness of the world, and negative emotional responses to losing internal and external resources. Symptoms of PTSD include involuntary intrusive thoughts, images or dreams of the traumatic event, symptoms of physiological hyperarousal, avoidance behaviors, and a state of decreased interests or emotional numbness (American Psychiatric Association, 1994).

Numerous precipitating events may trigger the occurrence of trauma related symptoms. Leaving home for the first time and entering post-secondary institutions, child physical and sexual abuse, assault and rape, combat exposure, motor vehicle accidents, and natural disasters all have the potential to elicit symptoms of trauma or PTSD in individuals who are exposed to or survive these events (Pennebaker, Colder, & Sharp, 1990; Batten, Follette, Hall, & Palm, 2002; Martin, Rosen, Durand, Knudson, & Stretch, 2000; Schnurr, Friedman, Lavori, & Hsieh, 2001; Norris, Kaniasty, Conrad, Inman, & Murphy, 2002).

One important aspect in the determination of the development of trauma related symptoms or PTSD in each of these traumatic events is the type of coping mechanism that the individual employs. The type of trauma that individuals experience can potentiate the psychological consequences, which in turn can impact the physiological outcomes to these individuals. However, there is a mediating variable between the psychological and the physiological outcomes: the type of coping that the individual employs when faced with the traumatic stressor. Thus, a critical component in the development of PTSD and/or trauma related symptoms are the coping strategies on which the individual relies to manage the stressor. Coping can be defined as the “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p.141). The functional role that each coping mechanism (e.g., emotion-focused vs. problem-focused, social support, approach/avoidance, meaning-making, reframing cognitive schemas, locus of control, and writing) plays in an individual have been discussed in the literature (e.g., Taft, Stern, King, & King, 1999; Kiecolt-Glaser et al., 1985; Horowitz, 1997; Pennebaker & O’Heeron, 1984; Pimlott-Kubiak & Cortina, 2003; Conner, Davidson, & Lee, 2003; Davis, Nolen-Hoeksema, & Larson, 1998).

Traumatic Experiences and Psychological Consequences

A particular and pernicious form of trauma is early childhood maltreatment which affects individuals both psychologically and physically. Childhood physical abuse has been associated with aggressive behavior in both childhood and adulthood (Edwards,

Golden, Felitti, & Anda, 2003), health risk behaviors in adulthood such as smoking, alcoholism, obesity, and unsafe sex practices, and a greater number of psychological diagnoses (Walker et al., 1999). In addition, sexual abuse also has been linked to maladaptive sexual conduct and emotional abuse to low self-esteem (Briere & Runtz, 1988). Rosen and Martin (1996) reported impaired social functioning, anxiety, and phobic symptoms in a sample of childhood maltreatment survivors.

A traumatic stressor does not have to occur in childhood to have a deleterious impact. Survivors of adult sexual assault often suffer from decreased sleep quality, distress, anxiety, depression, PTSD, lifestyle changes, physical problems, emotional reactions to the event, and decreased quality of life in general (Krakov et al., 2002; Clum, Nishith, & Resick, 2001; Tyra, 1993). Higgins and Follette (2002) showed that the impact of adulthood sexual trauma can last for many years after the original trauma occurred. Survivors of sexual assault often suffer from nightmares, insomnia, sleep-disordered breathing, and functional impairment long after the initial trauma exposure (Krakov et al., 2002; Clum et al., 2001).

The psychological consequences of traumatic experiences are legion. The outcomes of such stressors include aggressive behavior (Edwards et al., 2003), impaired social functioning (Rosen & Martin, 1996), psychological disorders (Walker et al., 1999), low self-esteem (Briere & Runtz, 1988), and revictimization later in life (Higgins & Follette, 2002). In addition, Janoff-Bulman (1992) reported individuals with traumatic histories might form negative schemas about themselves, others, and the world. Such negative schemas form filters between trauma survivors and their experiences in the

world, leading them to ever more circumscribed and limited life. Using substances (Tedeschi & Calhoun, 1995), experiencing decreased sleep quality and increased anxiety and depression, PTSD and physical problems (Krakov et al., 2002; Clum et al., 2001; Tyra, 1993) also are common psychological symptoms of individuals who have survived a traumatic stressor either in adulthood or childhood.

Physical Consequences

Although much research has focused on understanding and describing the psychological implications of experiencing traumatic events, recent work has focused on understanding the physical health and physical functioning repercussions of experiencing a traumatic event. PTSD is thought to influence physiological health through the interaction of biological and psychological mechanisms (Schnurr & Friedman, 1995). The exact mechanistic process whereby this occurs is unclear.

Koch (2002) reported that, overall, patients with PTSD have more physical health problems, perceive their health as worse, and seek medical interventions more than their same age and gender counterparts. Thus, the experience of traumatic events appears to contribute to the pathogenesis of somatic diseases. Such physical health symptoms range from minor health concerns such as coughing and headaches to more serious medical conditions such as cardiovascular problems, immunological suppressive conditions, respiratory difficulties, and chronic pain (Koch, 2002; Bruijnzeel, Stam, Croiset, & Wiegant, 2001; Pennebaker et al., 1988; Walker et al., 1999). Various sleep disturbances (i.e., nightmares, sleep quality, insomnia, and sleep-disordered breathing) (Clum et al.,

2001; Krakov et al., 2002) and eating disorders (Rorty, Yager, & Rossotto, 1994) also may be physiological outcomes of trauma.

Thus, elevations of heart rate and blood pressure often occur in response to psychological stress and can be used as reliable measures to assist in determining the effects of stress on physical health (Shapiro, Sloan, Bigger, Bagiella, & Gorman, 1994). Both of the major stress-response systems in the body (the hypothalamic-pituitary-adrenal (HPA) axis and the sympathoadrenal system (SAS)) have been shown to be disrupted in individuals with PTSD, which suggests that regulation of the immune system may be hindered in these individuals (Altemus, Cloitre, & Dhabhar, 2003). “Dysregulation of the system, caused by the cumulative burden of repetitive or chronic environmental stress challenges (allostatic load) contributes to the development of a variety of illnesses including...certain disorders of immune function”(VanItallie, 2002, p. 40).

The limbic system, primarily the hippocampus and the amygdala, also is involved in the stress response. Continuous stress can cause elevations in corticosteroid levels negatively affecting hippocampal structure and function. These elevations can cause both memory and cognitive difficulties, which are evident in individuals with PTSD. Adult victims with PTSD have been shown to have lower than normal urinary and plasma cortisol levels, whereas prepubescent children with PTSD excrete greater than normal urinary cortisol levels years after the disclosure of the abuse (VanItallie, 2002).

Abnormal HPA axis production of cortisol has been reported in victims of childhood physical and sexual abuse (King, Mandansky, King, Fletcher, & Brewer, 2001;

Stein, Yehuda, Koverola, & Hanna, 1996; Heim et al., 2000). Kendall-Tackett (2000) demonstrated that individuals who experienced childhood trauma were “primed” to overreact due to the early chronic hyper arousal to subsequent new stressors. The increased reaction to stressors may continue the cycle of abnormal cortisol levels, especially in individuals who experienced childhood stressors and continue to experience adulthood stressors (Brewer-Smyth, Burgess, & Shults, 2004).

Coping Mechanisms

Researchers have speculated as to the direct and indirect influence of trauma on later physical health (e.g., Pennebaker et al., 1990; Batten et al., 2002). In particular, attention has been directed to the possible mediating variables between the psychological and the physiological outcomes including the types of coping that the individual employs when faced with the traumatic stressor. There are numerous types of coping strategies discussed in the literature on trauma. Problem-focused vs. emotion-focused coping was discussed by Lazarus and Folkman (1984) as one complementary set of coping mechanisms. Those efforts that involve concrete actions to deal directly with the problems are considered to be problem-focused coping. On the other hand, those efforts that are used to regulate one’s emotional response to the crisis are considered emotion-focused coping.

Social support has been examined as a coping mechanism in numerous studies and is a broad concept that encompasses many aspects of coping such as perceived social support, living arrangements, participation in group activities, communicating with another individual about the traumatic event, and simply having social contact. All of

these methods have been designated as aspects of social support that may play a role in buffering the effects of traumatic stressors (e.g., Ren, Skinner, Lee, & Kazis, 1999; Stephens & Long, 2000; Pennebaker & O'Heeron, 1984; Kiecolt-Glaser et al., 1987).

The basic approach/avoidance construct focuses on individuals' attempts to move toward or away from threat (Roth & Cohen, 1986) and is another type of coping strategy. Individuals may avoid traumatic material because of the potential psychological pain associated with those thoughts or encounters. At the same time, using avoidance as a defense mechanism may allow individuals to consider parts of the trauma rather than processing the entire event at once, thereby lessening the potential to be overwhelmed. McCann and Pearlman (1990) stated that avoidance is often used as a positive coping mechanism until individuals are ready to approach the traumatic memories. Resolution of the trauma is more probable when using approach coping strategies (Roth & Cohen, 1986). Using approach strategies when coping with traumatic stressors may allow individuals to seek out assistance when needed, cognitively process the trauma so they can move past it, and resolve the emotional fall-out of the traumatic event.

Meaning-making has been proposed as an important aspect of cognitive methods of coping (Frankl, 1984; Janoff-Bulman, 1992.). One theory of meaning focuses on the significance of the event in the individual's ability to form life goals and possibly to change those goals to develop a wiser sense of self (Helmreich & Steinitz, 1978). Another theory of meaning involves an individual's ability to develop a benign explanation for the loss or to make sense of the loss within existing schemas or worldviews (Janoff-Bulman, 1992).

Although the above list is not exhaustive, these methods are representative of the numerous types of coping strategies. Among them, written expression has been identified as particularly promising for alleviating the effects of stress. In the original study, Pennebaker and Beall (1986) demonstrated that writing about a traumatic event had a significant impact on both psychological and physical well-being and, thus, may be able to serve as a useful mechanism in working with individuals in a therapeutic context. This type of coping is the focus of the remainder of this introduction.

CHAPTER II – CONCEPTUAL QUESTIONS

Written expression of the experience of a traumatic event has long been a method of coping. Psychological research has focused on how such an activity serves as a positive coping mechanism affecting psychological and physical outcomes following both traumatic events and everyday stressors (Pennebaker & Beall, 1986; Pennebaker, Kiecolt-Glaser & Glaser, 1988; Greenberg & Stone, 1992). Writing about traumatic events has been shown to have a positive impact on immune functioning, subjective distress, and number of health center visits, as well as blood pressure and skin conductance levels, among other outcomes (e.g., Pennebaker & Beall, 1986). These results bode well for the continued use of writing in therapeutic contexts to assist recovery from trauma. The conceptual promise of the link between emotional expression via writing and physiological mechanisms has stimulated considerable research interest in the past two decades.

Conceptual Questions

Important conceptual questions on the impact of written expression have centered on if and how such writing influences physical health. As with any new research area, there is little consensus about the best way to isolate, operationalize, and study the phenomena. To examine these issues, the generic research protocol will be outlined and the inconsistencies and confounding of this research procedure will be identified. The basic research format, established by Pennebaker and Beall (1986), asks subjects to

answer a battery of questionnaires the day prior to the actual writing. Participants completed pretest physical measurements (e.g., blood pressure levels, heart rates, skin conductance levels, cortisol levels, etc.), on that day as well. The researchers then randomly assigned subjects to an experimental group or a control group and told that they will be required to write about specific topics over each of the following four days. Typically, researchers instructed experimental participants to write about their most traumatic experience for 20 minutes. They allowed the participants to write about the same experience or different experiences during each writing session. Instructions prompt participants to write about their “deepest thoughts and feelings” (Pennebaker et al., 1988). Researchers instructed control participants to write about an assigned topic during the same amount of time focusing on specific objects or events in detail without discussing their own thoughts or feelings. The experimenter repeated instructions on each subsequent writing day.

Immediately before and after writing each day, participants complete brief questionnaires to assess their mood and physical symptoms. After writing on the fourth day, participants completed the same physical measurements taken initially. Finally, they completed post- experimental follow-up questionnaires and physical measurements after a specified follow-up time, usually six-weeks post-writing.

Most studies are similar in the manipulation of the time factor such as writing for three to four consecutive days with the time span ranging from 15 to 30 min, and a follow-up period typically occurring one to two-months post-initial assessment (Pennebaker et al., 1988; Richards, Beal, Seagal, & Pennebaker, 2000; Batten, Follette,

Rasmussen-Hall, & Palm, 2002). However, the methodology, although similar in the majority of studies, has varied considerably in other research protocols. For example, some studies have a treatment period lasting up to 1 year with a follow-up period of 2 years (Schnurr et al., 2003) and other studies with treatment periods of 3 min have no follow-up conducted (Paez, Velasco, & Gonzalez, 1999).

However, the outcomes of such studies demonstrate that the time spent writing is an important component in participants' appraisal of the event about which they are writing, their affective status, and the psychological and physical problems reported. The length of the writing time, instructions given to the participants, length of the follow-up period, types of traumatic events disclosed, whether participants meet criteria for PTSD, etc. are all important aspects to examine when determining if the studies are consistent and comparable.

For instance, writing time varies from 3 min during one writing session to 30 min over four writing sessions. The instructions to participants typically follow the standard protocol established by Pennebaker (1989). However, some studies allow participants to write about different traumatic events each day whereas others instruct participants to write about the same event during each session (e.g., Brown & Heimberg, 2001; Batten et al., 2002). The type of traumatic event being studied can vary within and between studies as well. Some studies examine solely childhood sexual abuse (i.e., Batten et al., 2002) or solely combat trauma (i.e., Wolfe, Schnurr, Brown, & Furey, 1994). Other studies allow participants experiencing any stressful event such as entering college, taking exams, being sexually assaulted, etc. to be included (e.g., Pennebaker et al., 1988). These

differences can make accurate outcome comparisons between experiments difficult. Thus, transformation of internal states via writing may be, in part, a product of the experimental manipulation (i.e., time factor, instructions, etc.) rather than the writing itself.

Measurement Processes

Not only does the protocol of treatment and follow-up times vary from study to study, but the method of investigation of the somatic effects of writing also varies. For instance, Richards et al. (2000) used number of infirmary visits as the dependent variable to determine the level of physical health complaints by participants. Pennebaker et al. (1988) examined blood pressure levels, heart rate, skin conductance levels, subjective levels of distress measured by self-report questionnaires, as well as health center use. Such variability in defining the health criteria and in determining the frequency and severity of physical complaints contributes to the inconsistencies among the studies. For example, visits to the infirmary simply is a more complex outcome than heart rate or skin conductance and treating these dependent variables as equivalent is likely to lead to inconsistent findings. Additionally, the validity of measurement of physical problems is limited by studies that rely solely on self-report measures.

More thorough investigations, (e.g. Pennebaker & Beall, 1986), which use more extensive criteria, are better able to determine direct effects of writing on individuals' actual health rather than their cognitive appraisal of their health status. In fact, it would seem that both actual psychophysiological measures and psychological measures should be used as each may make independent contributions to long-term outcomes.

By using solely psychological or physiological measures, researchers could miss important effects that writing has on participants in one or the other system. Moreover, the relationship between the psychological and psychophysiological processes in individuals is impossible to define and examine if both psychological and physiological processes are not measured. By using physiological measures in examining participants, results may be obtained that would not have surfaced using only self-report measures. However, by relying solely on physical measurements, individuals are not allowed to express themselves in terms of their subjective states and psychological distress. Hence, both types of measures should be examined in the research process.

Definitions of Trauma

Another difficulty in this research area involves the operational definition of “traumatic events.” For example, the qualifying criteria for inclusion as a traumatic event in studies have ranged from entering college, to long-term sexual abuse, to working on a police force or serving in active military combat (e.g., Kiecolt-Glaser et al., 1984; Martin, Rosen, Durand, Knudson, & Stretch, 2000). Little or no distinction has been made between events that meet criteria for post-traumatic stress disorder (PTSD), according to the Diagnostic and Statistical Manual for Mental Disorders-Fourth Edition (American Psychiatric Association, 1994), and those that do not meet such criteria. At minimum, asking individuals to write about the most traumatic event in their lives using emotional language requires researchers to define the type of trauma being addressed. Clearly a writing assignment about entering college will not have the same physiological impact on individuals as those who are writing about an event meeting criteria A of PTSD, such as

rape. Such dramatic differences among the individuals “most traumatic event” will likely have a significant impact on research results. Investigators should develop psychological scaling procedures to assist in defining the level of trauma. By using a procedure that scales trauma severity, researchers can analyze and compare results more consistently within and between studies.

The importance of distinguishing between “trauma” and “stressful event” is critical. Studies examining survivors of sexual abuse and rape have not demonstrated significant results on physical health using the writing paradigm (Batten et al., 2002; Brown & Heimberg, 2001). On the other hand, writing about less severe stressful events such as entering college or taking a final examination have shown positive effects on the immune system, autonomic levels, health center use, and subjective distress (Pennebaker, Colder, & Sharp, 1990; Kiecolt-Glaser et al., 1984). Thus differences in outcomes among the groups based on trauma severity are unclear. It may be possible that writing affects only those stressful events that do not meet PTSD criteria.

Another possibility for the discrepancy in findings is that individuals who are disclosing a severely traumatic event may be less prone to disclose all of their “deepest thoughts and feelings” during an experiment than individuals who are discussing leaving home to attend college. Many studies use undergraduates who are participating for extra credit points in class as their subject pool. These individuals may choose to disclose less threatening material given the context in which they are being examined, so the information they are disclosing is not a true representation of their “most traumatic event.”

Methodological Variations

A methodological resolution to such problems, as discovered as a result of the present research, is to separate the writing groups into a control group writing about neutral information, an experimental group writing about a stressful life event not meeting PTSD criteria, and a second experimental group writing about an event that meets criteria for PTSD. Having the groups differentially defined and separated may allow researchers to distinguish more accurately any significant findings among groups. Specifically defining and controlling for the severity of the trauma also might allow investigators to determine better the underlying cause of the success of the writing paradigm for improving physical health for some stressful events while having a deleterious effect or no effect for other events.

A second consideration in defining trauma is the lack of stability in the traumatic construct itself. For instance, an event may be traumatic for one individual and not for another. Therefore, separating groups solely on the basis of whether the event meets the criteria for PTSD may not be adequate for differentiating the groups. Two individuals may have experienced a common traumatic event, but one meets the requirements for PTSD while the other does not. Having participants rate the amount of subjective distress caused by the event as well as defining the event itself prior to participating in the writing portion of the experiment may assist in creating a more precise experimental record.

Separating groups allows for more homogeneity within the groups with regard to the psychological effects of the trauma, which may be helpful when examining the

resultant physical health outcomes. For example, for individuals who rate their traumatic experiences as less severe than others, researchers can hypothesize less impact on their physiological outcomes after writing than for participants who admit to having more initial distress. Therefore, determining the amount of subjective distress and level of trauma of participants before administering the writing protocol will aid in the process of specifying the effects of the writing paradigm on participants.

Pennebaker et al.'s (1998) protocol permits participants to write about different traumatic events during subsequent sessions or the same event for all writing sessions. They found that allowing participants to choose the topic of their essays produced more robust findings. However, the lack of control over the topic of discussion could be confounding. For instance, some individuals may choose to write about a current ongoing event that meets criteria for PTSD and report high levels of subjective distress; other individuals may choose to disclose distinct childhood events that do not meet PTSD criteria and no longer have significant psychological impact on them. Comparing participants with such variability should lead researchers to identify and operationalize the broad spectrum of events they are studying as well as the time frame of the events' occurrences. The differences in the events that participants discuss, also, may allow researchers to examine the initial levels of psychological and physical distress in order to examine the lasting effects of the written disclosure and determine whether the trauma is ongoing or in the past.

However, not all inconsistencies among research groups can be controlled for and examined in one study. Research focusing on the difference between writing groups

likely will necessitate multiple examinations of different combinations of group dynamics (i.e., the time frame of the trauma, the trauma severity, and the type of participants used in the study, etc.).

The majority of studies examining the effects of written disclosure emphasize the improvements in individuals' physical health (e.g., Pennebaker & O'Heeron, 1984; Richards et al., 2000). However, the literature discusses relatively little about the psychological ramifications of writing. The typical psychological outcome assessed has been mood changes, with some showing positive changes in mood (Lepore, 1997), some showing no improvement (Pennebaker et al., 1988), but the majority showing negative changes in mood initially (e.g., Schoutrop, Lange, Hanewald, Davidovich, & Solomon, 2002). At a basic level, positive or negative moods may be ambiguous criteria. If, as Proust asserted, "pain is the great doctor," then negative moods may have positive long-term outcomes by motivating changes in behavior or coping.

Some studies have found positive outcomes on depression symptoms using the writing paradigm (Lepore, 1997; Sloan & Marx, 2004). Lepore (1997) examined the effects of writing before the stressful event occurred. Participants wrote about the stress of taking an upcoming graduate entrance exam before taking the test. Following the exam, students reported fewer depressive symptoms although their reported frequency of intrusive thoughts did not change. Sloan and Marx (2004) found significant reduction in depressive symptoms only in their experimental group when writing about a stressful event that had previously occurred. Thus, although, these studies examine the results of writing, the question about exactly what creates this positive change remains unanswered.

Simply discussing the results of writing is far too narrow a scope for research; identifying, categorizing, and measuring the psychological processes involved in the writing process seems the critical next step. Without such, the pathway by which written expression influences health cannot be traced.

Research shows that writing about a traumatic event might negatively influence psychological health in the short term, but positively influence physical health in both short and long-term follow-up. Because researchers are hypothesizing a link between psychological and physical health, it should follow that writing could produce either positive or negative outcomes for both types of health being assessed. In other words, individuals could experience negative outcomes for both psychological and physical or positive outcomes for both, given the assumed relation between the two domains. In samples where positive psychological changes are found after writing, positive physical changes are expected to follow. The interesting phenomenon is that regardless of the level of psychological discomfort, most studies present positive findings for health-related benefits of written expression of a traumatic event (e.g., Sloan & Marx, 2004; Pennebaker & O’Heeron, 1984). Therefore, it is critical to examine theoretical hypotheses regarding the pathway from the psychological to the physical symptoms.

Mechanisms of Action

The most critical question that the literature currently leaves unanswered is the biopsychological pathway by which the writing paradigm influences physical health. Pennebaker (1989) hypothesized that the work of emotional inhibition exacerbates stress-related disease processes. Allowing individuals to write about the stressful event

decreases the physical costs of inhibiting the trauma and, thereby decreases the resultant physical repercussions, releasing the energy needed for the well-being of the person. Thus, written expression of the traumatic event using positive emotional words releases the internal stress of keeping the event suppressed (Pennebaker et al., 1988). A common assumption in the psychotherapy literature is that individuals cope better with trauma if they are able to understand it and assimilate it into their cognitive framework (Sloan & Marx, 2004). If individuals assimilate the information about the trauma, they will utilize less energy inhibiting the thoughts and feelings surrounding the traumatic event.

Pennebaker et al. (1988) stated that confronting a trauma may be beneficial for two different reasons. First, studies have shown that “actively inhibiting ongoing behavior is associated with both short-term autonomic activity and long-term stress-related disease. Confronting a trauma, then, may reduce the long-term work of inhibition. Second, by confronting the trauma, individuals may assimilate, reframe, or find meaning in the event” (Pennebaker et al., 1988, p. 240). However, more recent studies indicate that emotional expression may facilitate cognitive processing of the trauma, but the success of the writing paradigm is not attributable solely to processing the event.

The question remains as to what specifically about the writing produces a change in the individual’s improved mental and physical well-being. Cognitive processing occurs when disclosing a traumatic event verbally and when writing about it. However, beneficial results from writing can be seen after only 3 min, (Paez et al., 1999), which does not support the cognitive processing theory. Individuals may be capable of

discussing the trauma verbally while continuing to avoid it mentally, whereas the act of writing may activate a different portion of cognitive processing, which makes it more difficult for individuals to avoid the emotional impact of the disclosure, thus having more impact.

According to the emotional inhibition theory (Pennebaker et al., 1988), cognitive processing, which occurs when writing about the trauma using emotional words, leads to affective and physiological changes. “Specifically, written emotional expression leads to the transduction of the traumatic experience into a linguistic structure that promotes assimilation and understanding of the event, and reduces negative affect associated with thoughts of the event” (Smyth, 1998, p. 175). The theory assumes that when individuals inhibit their thoughts, feelings, and behaviors over long periods of time, stress is placed on the body due to the amount of physiological work required to inhibit emotions. Cumulative stress over time results in increased susceptibility to diseases (Greenberg & Stone, 1992). The ability of individuals to conceptualize the trauma in a manner such that they can think about it in a mastery-related manner, or, alternatively, they can discuss it with others reduces inhibition and thereby increases physical wellness.

Although there has been some support for the emotional inhibition theory (e.g., Cohen & Williamson, 1991; Pennebaker, 1989), there is no evidence supporting the hypothesis that decreases in inhibition mediate the relation between writing about stressful or traumatic events and improved physical health (Sloan & Marx, 2004). In fact, there has been evidence to the contrary. Writing about stressful or traumatic events that already have been discussed with others is just as likely to produce beneficial health

results as writing about stressful or traumatic events that have not been discussed with others (Pennebaker, 1989). Such a result demonstrates that decreases in inhibition alone may not be the sole mediator between emotional written expression and improvements in physical health or, alternatively, that interpersonal verbal expression is not isomorphic with internal disinhibition. As stated previously, individuals may be demonstrating a decrease in inhibition by disclosing verbally the traumatic event, but they may be continuing to avoid assimilating the event into their cognitive schema.

Therapeutic Exposure

Writing about traumatic events may serve as exposure to aversive conditioned stimuli. Foa & Kozak (1986) asserted that, for exposure-based treatments to be successful, individuals must first experience intense negative affect when confronted with aversive stimuli. In such circumstances, the negative affect will gradually decrease after repeated exposures. Thus, some researchers (e.g., Lepore, Greenberg, Bruno, & Smyth, 2002) have argued that writing allows individuals to be exposed to aversive stimuli related to the traumatic event and to other aspects of the event, which previously may have been avoided (e.g., memories, emotions). Repeated exposure to the event through writing is hypothesized to reduce negative emotional associations and result in positive psychological outcomes (Sloan & Marx, 2004).

To test this hypothesis, Sloan and Marx (2004) examined women from an introductory psychology class who had reported one or more traumatic stressors and had at least moderate levels of PTSD symptom severity. They randomly assigned participants to a written emotional disclosure condition or a control writing condition.

Following Pennebaker's (1997) protocol, they instructed participants to write for 20 min over 3 consecutive days. Participants wrote about the same or different traumatic experiences during each session. Researchers gave participants self-report measures of both psychological and physiological symptoms prior to writing and at a 4-week follow-up. The researchers collected saliva samples immediately prior to writing and 20 min after each writing session. They found increased physiological reactivity in the experimental group compared to the control group in the first writing session only. They found the initial increase in physiological activation to be associated with fewer psychological symptoms, but found no relationship between initial physiological activation and changes in self-reported physical symptoms. Sloan and Marx's (2004) hypothesis that repeated exposure to traumatic memories was the pathway by which writing mediated psychological and physiological outcomes was not supported. They indicated that the critical component in the extinction of a conditioned emotional response might be the presentation of any stimulus eliciting a negative affective state rather than exposure to the specific traumatic memory.

However, Kloss and Lisman (2002) found no difference between control and experimental groups regarding physical outcomes when testing the exposure hypothesis. They assigned college undergraduates to one of three writing conditions: a traumatic-stressful experience, a positive experience, or a trivial topic control group. Participants completed both psychological and physiological measures prior to writing and 9 weeks follow-up as well as anxiety measures immediately before and after writing to determine if anxiety initially increased and then decreased during the writing sessions. They found

significant group differences for both psychological and physical measures. In addition, state anxiety increased from measurements taken prewriting to postwriting and did not decrease across the writing sessions. However, the researchers did not conduct objective physiological measures, which might have provided more comprehensive data on their participants' actual physical change during the experiment.

Written Disclosure vs. Therapeutic Exposure

Both of these studies demonstrate a lack of evidence for the hypothesis of exposure to traumatic memories being the critical factor in the writing paradigm. Further research to investigate the possibility that exposure to a negative affective state by writing can produce positive physiological results would be useful. More comprehensive measurements, such as objective measurements of physical health, also should be taken to obtain more thorough data.

However, there are several differences between the written disclosure procedure and other therapeutic exposure models that mitigate any conclusion about whether the exposure paradigm is actually being tested in the written disclosure procedure. One difference between the written disclosure procedure and therapeutic exposure models is that the person is not required to write about the same event during each of the sessions during the written disclosure procedure, thus it may not be accurately testing the exposure model. In addition, it may not be necessary for participants to be exposed to the same traumatic event repeatedly in order to see positive effects. Rather, it may be exposure to any stimulus that produces a negative affective state that produces the reduction in symptoms in exposure-based written disclosure (Sloan & Marx, 2004).

One criticism of the therapeutic exposure hypothesis is that exposure can occur when people disclose the trauma verbally as well as when it is written. Given that studies have found no difference in health outcomes between individuals who previously have disclosed their trauma and those who have not disclosed previously following a writing session, the exposure hypothesis is called into question. Another criticism is that research findings have demonstrated beneficial results in physical health where writing occurred in one setting for 3 min (Paez et al., 1999). According to the exposure paradigm, writing would need to occur multiple times to the same conditioned stimulus in order for individuals to be desensitized to the negative emotional associations. Thus, extinction can only take place across multiple writing sessions. Exposure may continue to occur mentally after the participants have completed the writing portion of the study and, therefore, at follow-up periods, positive results occur. However, the question remains as to why written expression of the event impacted the individual differently than verbal disclosure, which does not seem to be accounted for by the exposure paradigm.

Another hypothesis regarding the conceptual pathway by which writing influences physical health is by cognitive restructuring. Smyth, True, and Souto (2001) examined this phenomenon by having healthy students write about a prior traumatic experience using a narrative format, or about the experience using a list in a fragmented format, or to write about control topics. The fragmented group did not differentiate from the control group on any measure. Participants in the fragmented list group disclosed similar amounts of emotion and personal topics compared to the narrative group.

However, the narrative writing group showed some indication of health improvements and alteration of avoidant thoughts.

Smyth et al. (2001) suggested that simply writing is not enough to demonstrate significant changes in health outcomes. Rather, it is the narrative format that assists in restructuring the cognitions surrounding the traumatic event. Their hypothesis that intrusions would decrease in the narrative writing group was not supported. Following the cognitive restructuring format, they expected to find an initial increase in avoidant thinking after the writing session and then a return to baseline. However, they found a persistent elevation in avoidant thinking. One explanation given for the continuous avoidant thinking pattern was that one writing session serves a sensitizing function and participants actively try to avoid thinking about the traumatic event. However, over multiple writing sessions, participants may habituate to the traumatic memory. Participants showed health benefits, even with increases in avoidant thinking, after a single writing session.

The question once again is raised in the literature as to the pathway through which the process of writing works to assist in physiological health even with detrimental effects on psychological health. At the same time, with the deleterious effects to individuals' psychological health, clinicians need to question whether the benefits to physical health outweigh the possible deleterious effects to mental health. With the data showing different results for different populations regarding the beneficial effects of writing, more research needs to be conducted to ascertain if the positive effects are

demonstrated simply for individuals who have experienced stressful events or certain populations with no previous trauma meeting PTSD criteria.

There are numerous inconsistencies in the research that future experimentation should address. Some problems in the current research literature have been outlined and some possible resolutions to them have been suggested (e.g., Smyth, 2004). Some of the possible underlying mechanisms by which the writing paradigm may work have also been examined. The question of causation between the psychological effects of writing and the beneficial health outcomes continues to need further attention.

At a minimum, more research needs to be conducted to specify the conceptual pathway through which the written expression paradigm works. Individuals with previous traumatic experiences meeting PTSD criteria, previous stressful experiences, as well as ongoing traumatic and stressful experiences need to be compared. Defining the construct of trauma within and between studies needs more attention; development of a scaling procedure may assist in this process. Comparing the narrative versus fragmented written format with a verbal disclosure format may also be beneficial for future research.

CHAPTER III – DISCREPANCIES IN THE LITERATURE

The writing paradigm has been examined by numerous researchers for trauma resolution with various populations (i.e., college students, female childhood abuse survivors, veterans). However, the majority of the research conducted thus far has been with healthy populations. Although, there are some preliminary data examining the utility of written expression with more severely traumatized individuals (Batten et al., 2002), the results are inconclusive on its effectiveness with individuals who have a significant history of abuse. Moreover, few studies have examined both the psychological and physiological outcomes following the writing exercise. Finally, only a few studies have been conducted with incarcerated individuals, a population with high rates of trauma exposure.

Richards et al. (2000) conducted a study using male psychiatric prison inmates convicted as both sex offenders and non-sex offenders as participants. They found that participants in the writing condition experienced more physical symptoms immediately following the writing sessions than participants in the control group. Controlling for prewriting infirmary visits, sex offenders in the trauma writing condition decreased their post writing infirmary visits. Richards et al. (2000) hypothesized that disinhibition was one possible conceptual pathway by which writing assisted the individuals in this study, given that writing has been shown to improve health for individuals who are more inhibited, such as men (Smyth, 1998) and persons high in hostility (Christensen & Smith,

1993). However, this study did not use physiological measures to evaluate the effectiveness of the writing paradigm.

The current study examined the effects of writing with female inmates who have been shown to have a high rate of childhood and adulthood trauma. Using psychological measures in the form of questionnaires, subjective physical measures in terms of questionnaires, and objective physiological measures including heart rate, blood pressure, and cortisol, researchers evaluated the impact of written expression about traumatic events. Following Pennebaker et al.'s (1988) protocol for writing, a goal of this project was to determine the impact of writing an account of the most traumatic event in their lives using emotional language vs. a non-emotional account of the previous day's activities. In addition, conceptualizing PTSD as a continuum, I will examine if the subjective level of distress was a mediating variable between psychological trauma and physical health when using the writing paradigm as a coping intervention.

There were several methodological and conceptual differences in the literature on written expression. One methodological variation was the time spent writing and the follow-up period. Pennebaker (1986) set up the standard protocol for writing 3 to 4 consecutive days for 20 min intervals. Other studies had considerable variability from treatment periods lasting 1 year with a follow-up period of 2 years (Schnurr et al., 2003) to treatment periods of 1 min with no follow-up period (Paez et al., 1999). The present study followed the standard writing protocol for 3 consecutive days for 20 min intervals with a 7-week follow-up period because this protocol has been shown to demonstrate the effectiveness of the procedure for both psychological and physical measurements. In

addition, researchers did not manipulate the time of the writing condition in the present study; the writing time stayed consistent at 20 min. throughout the study. The instructions to participants followed Pennebaker's (1989) standard protocol.

The type of traumatic event varied among studies as well. Some studies investigated solely childhood sexual abuse (i.e., Batten et al., 2002) or solely combat trauma (i.e., Wolfe et al., 1994) whereas others allowed participants to write about any stressful event (i.e., Pennebaker et al., 1988). The current study asked participants to write about "the most traumatic event" that has ever occurred in their lives. Having participants write about their subjectively chosen most traumatic event rather than making the assumption about what was most traumatic provided a more clinically useful and powerful test of the writing paradigm.

Another difference among studies has been the method of investigation of the somatic effects of writing. Some studies have used number of infirmity visits (Richards et al., 2000) as the primary source for determining beneficial results of writing. Other studies have used solely subjective questionnaires for quantifying results; whereas other studies have used more comprehensive objective and subjective measurements (e.g., Pennebaker & Beall, 1986). The current study used the more extensive criteria set of both subjective questionnaires regarding psychological and physical well-being and objective measurements of heart rate, blood pressure, and salivary cortisol levels. Using extensive criteria measurement processes, the relationship between psychological and physiological effects can be traced more specifically. In addition, the physiological measurements permit insight into the physical well-being and functioning of the

participants in a way not accessible through questionnaires. The relationship between the two systems, psychological and physical, is difficult to examine if both processes are not measured.

Another difficulty recognized in the literature is the lack of an operational definition of “trauma” and “stressful event.” Stressful events meeting the criteria for PTSD and those that do not meet the criteria both appear to benefit from the writing paradigm. The current study addressed this issue by allowing participants to write about the most stressful event regardless of meeting the criteria for PTSD as it would be difficult to determine the viability of the diagnosis without a comprehensive interview.

Many studies in the area of written expression have been conducted with healthy populations of undergraduate students. Very few studies have examined individuals with significant histories of trauma. One study examined male inmates in a psychiatric prison (Richards et al., 2000), but no studies have examined female inmates using the writing paradigm. Female inmates have been shown to have a significant level of trauma in their lives (e.g., Milligan & Andrews, 2005) and thus, represent a critical population for evaluating the effects of emotional writing.

CHAPTER IV – HYPOTHESES

Based on the findings from previous studies conducted on the influence of expressive writing on psychological and physiological well-being, several findings were expected from the current research protocol. Because cortisol demonstrates the effects of stress in a relatively short timeframe, researchers expected that effects of the writing task would be evident immediately following the writing procedure. We hypothesized that individuals in the experimental group would demonstrate a higher degree of cortisol increase than those in the control group after the initial writing task, since writing about distressing events was expected to increase the amount of stress that the individuals were experiencing. However, following the writing task on the third day, researchers expected cortisol levels to be equal for the two groups. We expected the trauma-writing group to demonstrate a reduction in stress level from the first writing day to the third day as writing was hypothesized to reduce anxiety by allowing the individuals to express themselves about a previous trauma. We hypothesized similar results for the physiological measurements of heart rate and blood pressure as they also respond rapidly to increases in anxiety or emotional inhibition.

Researchers expected scores on the Pennebaker Inventory of Linguid Languidness (PILL) to be equivalent at baseline. We hypothesized the scores to increase more significantly for the trauma-writing group on the first and second writing days due to the content of the writing. The expectation was that the trauma-writing group would

demonstrate a greater reduction in scores on the third writing day as well as at the post-test.

Researchers expected similar results to the PILL for the PANAS scores. We hypothesized initial increase from the pre-test condition to the Day-1 and Day-2 writing conditions for both groups, with a greater increase for the trauma-writing group. We expected gradual decline on the third writing day for both groups with a more significant decline for the trauma group anticipated. Researchers expected the trend to continue to the post-test with the trauma-writing group demonstrating a more significant decline in scores than the control group; decreasing to baseline levels or lower.

Participants received the Brief Symptom Inventory (BSI) and the PTSD Checklist (PCL) measure more trait-like attributes and only at pre-test and post-test intervals. The expectation was that the experimental group would demonstrate a decline in scores demonstrating that the writing task decreased symptomatology.

Researchers expected the Mood and Anxiety Symptom Questionnaire (MASQ) to be equivalent for both groups at baseline. We expected the experimental group to show increases on the anxiety measures on day 3 with no change on the depression measures. Researchers expected anxiety to increase as a short-term function of the writing task, whereas, depression was viewed as a more stable trait, thus, we expected no significant changes in depressive symptoms until follow-up. At the follow-up, researchers expected the trauma-writing group to demonstrate more significant declines in depressive symptoms than the control-writing group. Scores on the MASQ measuring anxiety

would also show greater decline for the trauma-writing group at follow-up than for the control group.

Overall, we anticipated the scores declining for both groups on all measures. Based on previous research (i.e., Lepore et al., 2002), we expected a significant difference between the groups on the amount of decline shown based on the assigned writing task. Researchers hypothesized the physiological measures to show an immediate effect based on the assigned writing condition, whereas, some of the measurements examining trait-like symptoms would not demonstrate a significant difference until the post-test was conducted at the seven-week follow-up

CHAPTER V - METHOD

Participants

Researchers recruited participants from a maximum security women's prison in the southeast United States. This penitentiary is the only state level woman's prison in Alabama, housing all woman state inmates from death row to standard incarceration. After initial consultation with the Warden, she identified the inhabitants of six dormitories as available for participation. The six dorms were the mental health, discipline, honors, receiving dorm, and two general population dorms. The general population was housed in dormitories holding from 60 to 180 women sleeping side by side on bunk beds. Approximately 380 women lived in these dorms. The prison houses approximately 350 more inmates than it was originally designed to house.

A flyer stating the topic of the experiment and that participation in the project was voluntary was placed in these six dorms for recruitment purposes. Individuals interested in participating signed their names to a sheet attached to the flyer. Participation was voluntary and researchers assured participants that no negative repercussions for non-participation would occur. All participants received informed consent information before participation. The primary experimenter read the informed consent to the potential participants due to the concern of lower-level reading abilities. Potential participants asked any questions they had regarding the study and were escorted back to their dorm if

they chose not to participate. Four individuals chose not to participate in the study after reading the informed consent and being informed that they would not be further compensated for their time. All other participants signed the consent form to participate in the study.

Ninety-four women inmates incarcerated in Tutwiler prison completed the first day of testing. Eighty-three (88.3%) participants continued until the second day of testing when they were randomly assigned to either the control group (Group 1) or the experimental group (Group 2). Researchers assigned forty-two participants to Group 1 (Mean age = 38.26, SD = 9.82) and forty-one participants to Group 2 (Mean age = 38.80, SD = 9.07) on the second day of testing.

Participant Characteristics

The years of education for Group 1 (M = 11.80, SD = 2.26) was not significantly different from Group 2 (M = 11.74, SD = 2.03). The total number of years since the current crime was committed (Group 1, M = 5.83, SD = 5.77; Group 2, M = 5.87, SD = 5.01), the number of years incarcerated for the current crime (Group 1, M = 4.38, SD = 5.47; Group 2, M = 3.83, SD = 4.42), the total number of children who are currently incarcerated (Group 1, M = .05, SD = .29; Group 2, M = .12, SD = .40), and the total number of family members currently incarcerated (Group 1, M = .35, SD = .58; Group 2, M = .72, SD = 1.75) did not significantly differ between the groups.

Fifty-two (55.9%) women were Caucasian, thirty-four (36.6%) were African-American, and seven (7.6%) were of other racial backgrounds. One participant did not identify her race. There were no significant differences between the groups on the

reported number and type of physical or sexual abuse histories. There were no significant differences between the groups on their thought suppression (Group 1 = 56.56, SD = 12.64; Group 2 = 56.56, SD = 10.78) at pretest. These measurements indicate that the groups were matched for the number of traumatic occurrences, the level of trauma severity, as well as the coping strategies currently used by the women to cope with past and present stressful situations. As the measurement used to determine trauma severity and type of trauma does not have a total score available, the differences were examined on an item level. Item analysis revealed no significant differences (ranging from $p = .32$ to $p = .94$) between the groups. In addition, the symptoms resulting from significant traumatic events were notable in that 66.6% of individuals scored above the cutoff score of 40 on the PTSD Checklist.

In order to determine if there were any significant differences between the types of crimes committed by the participants in each of the groups, researchers conducted a chi-square analysis. Researchers found no significant difference ($p = .33$) between the groups for violent (Group 1 = 58.8%; Group 2 = 41.2%) and non-violent (Group 1 = 47.83%; Group 2 = 52.1%) crimes. In addition, the participants were equal on menopause status. Forty-seven percent of the participants in Group 1 and 53% of Group 2 had gone through menopause, 54% of Group 1 and 46% of Group 2 had not gone through menopause. There were no significant differences ($p = .38$) between the groups for estrogen replacement therapy at the time of testing.

Researchers conducted a chi-square analysis to see if there were any significant differences between the groups for smoking status. Of the eighty-three respondents,

63.86% reported currently smoking. There were no significant differences between the groups ($p = .41$). Given there were no significant differences between the groups on their current smoking status, the differential impact on the cortisol measurements was assumed to be minimal. Researchers also questioned the participants also about their drug/alcohol use at the time of their offense. There was no significant difference ($p = .43$) between the groups. 54.22% of the total respondents stated that they were using drugs and/or alcohol at the time of their offense, 36.14% reported not using any substances at the time of their offense, and 9.6% left the question unanswered. Researchers assessed drug and alcohol levels to determine possible coping strategy differences between the groups. The lack of significant difference ($p = .43$) between the groups on substance abuse indicates that participants utilized this type of coping mechanism approximately the same amount in both groups.

The randomly assigned groups did not demonstrate significant differences for any of the personal characteristics. Education levels, racial background, types and number of crimes, and substance use were equal for both groups. The number and type of traumatic occurrences as well as the participants' style of coping did not differ significantly between the groups. All of these measures demonstrate that the groups were initially matched for personal characteristics.

Measurement Characteristics

The Life Events Checklist (LEC) taken from the Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) was used to assess traumatic experiences. This measure includes a list of 17 different traumatic events (e.g., sexual assault, natural disasters, or

transportation accidents). Participants indicated whether they experienced each event, witnessed the event happening to someone else, or learned about the event happening to someone close to them. Participants were instructed to think about their worst event and answer questions addressing DSM-IV Criterion A1, such as whether someone's life was in danger during the event, and Criterion A2, whether they experienced fear, helplessness, or horror during the event.

The PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) was used to assess PTSD symptomatology. The PCL is a 17-item questionnaire, with each item corresponding to a DSM-IV symptom of PTSD. Using a scale from 1 (not at all) to 5 (extremely), participants indicated the degree to which they experienced each symptom in the past month. When observing a cutoff score of 44, the PCL has a sensitivity of .94, specificity of .86, and overall diagnostic efficiency of .90 (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996). Two-week test-retest reliability for this measure is high, .96 (Blanchard et al., 1996).

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegan, 1988) was used to assess participants' mood states. The PANAS is comprised of two 10-item mood scales examining both positive and negative affective states. The internal consistency reliabilities are high with .88 and .87 for the positive scale and negative scale, respectively.

The Brief Symptom Inventory (BSI; Derogatis, 1975) consists of 53 items covering nine symptom dimensions: Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation, and

Psychoticism: and three global indices of distress: Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total. The authors report good internal consistency reliability for the nine dimensions, ranging from .71 on Psychoticism to .85 on Depression. No alpha reliability is reported for the 3 global indices. Test-retest reliability for the nine symptom dimensions ranges from .68 (Somatization) to .91 (Phobic Anxiety), and for the three Global Indices from .87 (PSDI) to .90 (GSI).

In order to assess for sexual and physical abuse histories, researchers used a modified version of Meunzenmaier's scale (Meyer, Meunzenmaier, Cancienne, & Struening, 1996). This test examines physical and sexual abuse occurrences before and after age 18. For the original scale, the test-retest reliability yielded a Kappa of .63 for the measure of physical abuse and .83 for the measure of sexual abuse. Validity, assessed as consistency with an independent clinical assessment, showed 75% agreement for reports of physical abuse, and 93% agreement for reports of sexual abuse.

The Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker and Brittingham 1982) was used to assess the degree to which participants are aware of a number of physical symptoms. The PILL is a 54-item, 5-point scale assessing frequency of common physical symptoms and sensations. Symptoms were coded as present or absent and then summed to create a continuous variable indicating health concerns. The reported internal consistency for the measure is high (.88) (Pennebaker and Brittingham, 1982). The scale has been found to have reasonable convergent validity, correlating both with other physical health indicators and with measures of health concerns. The PILL correlates moderately with the Hopkins Symptom Checklist ($r = .48$, $N = 213$), the

Autonomic Perception Questionnaire ($r = .50$, $N = 75$), and the Cornell Medical Index composite score ($r = .57$, $N = 100$) (Kaysen et al., 2008).

Procedure

All individuals conducting the experiment, including the primary experimenter and all undergraduate assistants, were trained on safety procedures in the prison with prison personnel. The primary experimenter also trained all assistants on the ethical guidelines for conducting research with vulnerable populations. They completed the ethics training session administered online provided by the American Psychiatric Association. All assistants signed a confidentiality agreement before taking part in any aspect of the research.

One the first day of testing, a prison official escorted individuals who signed the flyer from a randomly chosen dormitory to the testing facility. At least one trained correctional officer or prison personnel were in attendance at all times throughout the testing procedures. The testing facility was an air-conditioned 40 x 70 chapel separated from the main prison dormitories. Eight-foot long tables were placed throughout the facility with two to three participants at each table to ensure confidentiality. The initial instructions were as follows:

Welcome to the stress study conducted by Auburn University. My name is Jennifer Daniels and I will be the main person working with you if you choose to participate in this study. The research assistants for today are Ciarra, Crystal, Courtney, Kim, and Leslie (or Meg, Ashley, and Lauren). During the next few days, and again in 6 weeks, you will be asked to give some physical

measurements such as blood pressure, heart rate, and saliva samples. You will be asked to answer questions about your physical and mental health. You also will be asked to write about something that has happened in your life. You are not required to participate and you can leave at any time without any negative consequences from Auburn University, the Warden, or any prison official. Please be aware that you do not have to be in this research project. I hope that you will learn something about yourself and learn one way to cope with negative things that have happened to you that you can keep using after this study is finished to help you both mentally and physically. More information about the study will be given to you shortly and you will need to sign a consent form saying that you agree to participate, you understand that you are not required to participate and are choosing to participate of your own free will, and you will not be penalized in any way for not wanting to do the study. All of your answers on the questionnaires and all of your health measurements will be confidential. Only the researchers involved in this project will have access to your answers. You will be assigned a code number to make sure that all of your information is confidential. If you have any questions, please feel free to ask them now or at any time during the study.

Researchers gave participants informed consent documents, which then they read aloud, to ensure understanding of the project and their participation. Researchers gave inmates separate consent forms to sign in order to grant access to their infirmary records for the six weeks prior to the study and six weeks following the study. If they chose not

to participate at this time, prison officers escorted them back to their dormitory. After signing the informed consents, the women were given a card with their assigned study number. Their Alabama Identification System (AIS) number and their study number were kept on a separate sheet to ensure confidentiality. (The first person to enter the room was assigned number 1, the second person was assigned number 2, etc.). A master list of their AIS number in relation to their study number was kept throughout the study to ensure that no one participated twice and to maintain confidentiality. The master list remained in a locked file cabinet at the prison during the study and was destroyed at the end of the study. Using a random numbers table, researchers assigned the women to either a control or experimental group at this time.

The instructions following receipt of their cards was as follows:

Please keep up with these cards and bring them with you to each session. They contain your study number. These are very important to keep track of which group you are assigned to. During the session today, you will be asked to answer questionnaires on your mental and physical health. After finishing these questionnaires, you will be asked to provide your blood pressure and heart rate. If you have any trouble reading these questionnaires or if you don't understand a word, please raise your hand and someone will help you.

Participants were tested in groups of 10-18 in the chapel area during the questionnaire portion. We spaced them to ensure confidentiality. After receiving their study number, researchers gave each participant a set of questionnaires. The instructions for this portion of the experiment were as follows:

You will now be asked to answer questions about your physical and mental health. Some of the questions may be hard to answer, please do your best. If you have any trouble answering the questions, please raise your hand and someone will be glad to help you. Please answer all the questions honestly. Again, all information is confidential. Only the researchers connected with this project will handle and review the answers you give. After you have finished the questionnaires, please raise your hand and someone will come by to pick them up and to take your heart rate and blood pressure levels.

The subjects were then given questionnaires on demographics and physical and mental health. Research assistants walked around the room available to answer any questions. Each packet included the participants study number on each of the questionnaires for identification purposes. The questionnaires included the Pennebaker Inventory of Linguid Languidness (PILL) to assess subjective measures of physical health, Weathers PTSD scale to assess symptoms of posttraumatic stress disorder, Life Events Checklist (LEC) to assess exposure to traumatic events, Meunzenmaier's Scale to assess physical and sexual abuse in both childhood and adulthood, Mood and Anxiety Symptom Questionnaire (MASQ), and Brief Symptom Index (BSI). A research assistant collected all pens and questionnaires as each participant completed them indicated by their raising their hand. A research assistant took the participants' heart rate and blood pressure levels immediately following completion of the packet. They also gave all participants information about whom to contact if they experience any psychological discomfort throughout the study. The contact person for the study was the prison

psychologist who was closely involved with development and administration of the project. Depending on their dorm status, participants either returned to their job or dormitory, or a prison officer escorted them to their designated place or activity. Before being dismissed, researchers gave them the following instructions:

Thank you for participating in the first part of the study. You will be asked to come back again for the next 3 days to complete the remainder of the study. The next three days will be different than today. Please remember to bring the index card with your code number on it with you each day.

On the second day of testing, a prison officer escorted the same group of participants from their dormitory to the testing room. For each of the writing days, groups of 10-18 participated in the chapel area with tables spaced to ensure confidentiality. Each participant was given a notepad with a pen. They were given the following instructions as a group:

Welcome to day two of the study. The research assistants for today are Ana, Meg, Lauren, and Ashley (Ciarra, Crystal, Courtney, Kim, and Leslie) Today I am going to ask you to do some writing. Please write your code number at the top right corner of each page that you write on. Please follow the instructions that you are given about what to write. If you have any questions, please raise your hand and someone will come to help you. You will write for 20 minutes and I will tell you when to stop. After you have finished the writing portion of the study, you will be asked to provide your heart rate and blood pressure levels again. Some of you have been randomly chosen to provide cortisol levels by

taking saliva samples. This is the only purpose that the saliva will be used for.

Again, all information that you provide is confidential.

Research assistants passed out notebooks, pens, and written instruction sheets to one table at a time in 2 minute intervals. The instructions for the writing task was based on their assigned group from the previous day. If they were not able to read the instructions, assistance was provided. The instructions for the control group were as follows:

During today's writing session, I want you to describe in detail what you did yesterday. It is important that you describe things exactly as they occurred. Write like a reporter describing the events. Your description should be as objective as possible.

The instructions for the experimental group were as follows:

During each of the three writing days, I want you to write about the most traumatic and upsetting experiences of your entire life. You can write on different topics each day or on the same topic for all 3 days. The important thing is that you write about your deepest thoughts and feelings. Ideally, whatever you write about should deal with an event or experience that you have not talked with others about in detail.

Participants were given 20 min to write. The experimenter, an advanced clinical psychology graduate student, 3-6 undergraduate assistants, and at least one mental health professional from the prison, Steve Goodwin, M.S., were present during the writing portion of the experiment in the event that psychological discomfort should occur.

Participants were asked to “please stop writing” at the 20 min time limit. Blood pressure and heart rate levels were taken for all participants immediately following the writing portion of the session.

After the physical measurements were taken, approximately half of the participants were randomly chosen to have their cortisol levels taken. They were given a Salivette stick to chew on for 30-45 sec to obtain saliva samples for testing cortisol levels. After collecting the saliva, they were asked to put the stick in the accompanying vile. Their study code number was written on the vile by an experimenter when they were collected from each individual. The infectious disease protocol was followed while collecting the saliva samples. The collected vials were placed in an ice chest in the room until all the information was collected for Day 2.

Researchers gave each participant a packet of questionnaires following the collection of the physical measurements. The packets included the Pennebaker Inventory of Linguid Languidness, page 2 of the Life Events Checklist, and the Positive and Negative Affect Scale. After completing the questionnaires, research assistants collected the notepads and pens from the participants. The participants received the following instructions:

Thank you for participating today. You will be asked to return again for the next two days to complete the study. Please remember to bring the index card with your code number on it when you return tomorrow.

Depending on their dormitory status, prison officers escorted them to their

designated place or assignment or they were released to return to a designated place on their own.

The third consecutive day of testing was identical to the second day. A prison officer escorted participants from their dormitory to the testing facility. Researchers gave the participants a pen and a notepad for the writing session. Research assistants gave the materials to one table of participants at a time in two minute intervals. Based on their assigned group, we gave the participants the same instructions for their writing task as they received the previous day. Participants had 20 min to complete the writing task and then told to “please stop writing.” Research assistants collected the notebooks from the participants and immediately took their heart rate and blood pressure levels following the writing portion of the session. The researchers gave the participants the same packet of questionnaires to answer as on Day 2: the Pennebaker Inventory of Linguid Languidness, page 2 of the Life Events Checklist, and the Positive and Negative Affect Scale. Upon completion, we collected the pens from the participants. Prison officers escorted them to their designated place or assignment.

On the fourth consecutive day of testing, a prison officer escorted participants from their dormitory to the testing facility. Researchers gave participants a pen and a notepad for the writing session one table of participants at a time in 2 minute intervals. Based on their assigned group, researchers gave the participants the same instructions for their writing task as they received the previous day. They had 20 min to complete the writing task and then told to “please stop writing.” Research assistants collected the notepads from the participants, and took their heart rate and blood pressure immediately

following the writing portion of the session. All participants provided saliva samples for measuring cortisol after researchers took their physiological measurements. Researchers gave participants a Salivette stick to chew on for 30-45 sec to obtain saliva samples for testing cortisol levels. After collecting the saliva, they put the stick in the accompanying vile. A researcher wrote their study code number on the vile following collection from each individual. Researchers followed the infectious disease protocol while collecting the saliva samples. The researchers placed the collected vials in an ice chest in the room until all the information was collected for Day 4.

They were then given the following instructions:

Thank you for choosing to participate in this study. Once again, all of your answers and all of your physical measurements are confidential and only the researchers on this project will handle or review your information.

The participants completed a packet of questionnaires which included the Pennebaker Inventory of Linguid Languidness, page 2 of the Life Events Checklist, Positive and Negative Affect Scale, and Mood and Anxiety Symptom Questionnaire. When they completed the questionnaires, prison officers escorted the participants to a designated place, concluding Day 4.

Each group of participants followed the same protocol for each group of participants each week until 6 weeks. Due to an escape at the prison, the researcher was unable to conduct the follow-up portion of the study until 7 weeks. At the 7-week follow-up period, a prison officer retrieved subjects who participated in the initial

sessions from their dormitory and escorted them to the testing facility. Upon entering, they provided their code number. Researchers gave the following instructions:

Thank you for choosing to participate in the follow-up session of the study.

Today you will be asked to give the same physical measures and answer the same questionnaires as you did the last time we were here. Once again, remember that all of your answers are confidential and only the researchers connected with the project will handle or review your materials. Please answer all questions honestly and to the best of your ability. If you have any questions, or if you need assistance, please let me know by raising your hand and someone will help you. After you have finished answering the questionnaires, please raise your hand and someone will come to take your physical measurements. Thanks again for participating.

Subjects received the same questionnaires as given on Day 4. Upon completion of the questionnaires, they had their physical measurements including heart rate and blood pressure taken following the same procedures as previously noted. Researchers gave participants a debriefing statement including the name and telephone number of individuals to contact if they required psychological assistance or if they requested more information regarding the study. A prison officer escorted them to a designated place upon completion of the study. Seven-week follow-ups followed the same protocol for each cohort of participants.

On day 2 and day 4 of testing, the primary investigator transported the collected saliva samples on ice to the College of Veterinary Medicine where Dr. Ann Busch, who

was not informed of group placement or any type of identifying information of the participants, kept them in a freezer prior to analysis in her research laboratory. When she received all collected vials, she conducted the analyses for the cortisol measures. Upon completion of the analysis, Dr. Busch contacted the experimenter to inform her of the results.

CHAPTER VI - RESULTS

The design procedure used in the study follows:

Pre-Test	Day 1 – Writing	Day 2 – Writing	Day 3 – Writing	Post-Test
Brief Cope ERQ WBSI Muenzenmaier’s				
Cortisol ½			Cortisol all	
BSI PCL				BSI PCL
PILL MASQ	PILL	PILL	PILL MASQ	PILL MASQ
LEC Pages 1&2	LEC Page 2	LEC Page 2	LEC Page 2	
PANAS One week	PANAS State	PANAS State	PANAS State	PANAS One week
Blood pressure Heart rate	Blood pressure Heart rate	Blood pressure Heart rate	Blood pressure Heart rate	Blood pressure Heart rate

Analysis of Dependent Measures

The primary investigator analyzed the results by comparing the means for both groups on all measurements for each day of the study. The researcher conducted means comparisons for all of the pretest data including demographic information, trauma history, coping techniques, substance abuse histories, as well as measurements of mental, physical, and physiological health. We used the comparison of means to determine if there were any differences between the groups initially as well as within the groups over

time. A 2x5 with the group as the between and time as the within/repeated measure was conducted for all repeated measurements to determine if the independent variable was influential in improving subjective and objective measures of mental and physical well-being.

Self-Report Measures

Comparing the mean scores on the Emotion Regulation Questionnaire (ERQ) demonstrated no significant differences between groups (Group 1, $M = 44.41$, $SD = 10.95$; Group 2, $M = 46.35$, $SD = 11.2$; $p = .68$). Table 1 includes the means and standard deviations. The mean scores on the White Bear Suppression Inventory (WBSI) (Group 1, $M = 56.56$, $SD = 12.64$; Group 2, $M = 56.56$, $SD = 10.78$) indicated no significant differences ($p = .16$) between the groups suggesting that both groups suppressed thoughts of traumatic events equally. Participants completed both the ERQ and the WBSI only at baseline.

The results on the Meunzenmaier's Scale–Self Report demonstrated no significant differences in the means for the groups for sexual or physical abuse before or after the age of 18. Both groups reported equal number of sexual and physical abuse episodes occurring during their lifetime. Therefore, it can be assumed that the groups were equally distributed in terms of number of physical and sexual abuse instances as well as the severity of the abuse.

The researchers administered the PTSD Checklist (PCL) at baseline and at post-test to determine the extent of PTSD symptomatology in the participants. We conducted repeated measures ANOVA with the factor being the PCL. The results for the ANOVA

indicated no significant interaction ($p = .22$); however, we found a significant main effect across time, $F(1, 44) = 7.89$; $p < .01$, partial $\eta^2 = .149$. Though the trauma-writing group showed a more substantial decline in PTSD symptoms than the control group, those differences were not significant and both groups demonstrated a decline in symptoms across time. The means and standard deviations are presented in Table 2.

In addition to examining the number of instances and the severity of the abuse, researchers assessed coping strategies for each of the groups. Item analysis of the Brief Cope demonstrated no significant differences between the groups for the way in which they typically coped with being in prison with the exception of one item which indicated a significant difference, $F(1, 80) = 5.86$, $p < .05$, with the experimental group scoring higher. The item stated, "I've been saying to myself 'this isn't real.'" With the number of questions on this test, a conservative interpretation is warranted on the significance of one particular item. All other questions on the measurement did not show a significant difference between the groups.

Researchers conducted repeated measures ANOVA with the factor being the test measurements at each time period and the dependent variable being the outcome scores on the measurement for each group. Participants completed the Positive and Negative Affective Schedule (PANAS) at five different time intervals. The first measurement occurred at baseline, the second occurred on Day 2 after the first completed writing task, the third measurement occurred on Day 3 following the second completed writing task, the fourth occurred on Day 4 following the third completed writing task, and the final measurement occurred at a seven-week follow-up period during which no writing took

place. The means and standard deviations for the PANAS negative affect are reported in Table 3 and are demonstrated in Chart 1. The results for the ANOVA indicated no significant interactions $F(1,47) = 1.37, p = .25$; however, a significant main effect was found across time, $F(1,47) = 16.58, p < .001$, partial $\eta^2 = .261$. Researchers conducted pairwise comparisons to determine where the differences occurred based on time. There was a significant difference ($p < .05$) between the first writing day (time 2) and seven-week follow-up scores with means decreasing over time indicating decreased negative affective symptoms for both groups.

PANAS Factors

Researchers conducted repeated measures ANOVA with the factor being the test measurements at each time period and the dependent variable being the outcome scores. The means and standard deviations for the PANAS fear subtest are reported in Table 4 and Chart 2. The results for the ANOVA indicated no significant interactions $F(1,48) = .04, p = .84$. We found a significant main effect across time, $F(1,48) = 12.21, p < .01$, partial $\eta^2 = .203$. Researchers conducted pairwise comparisons and found a significant difference ($p < .05$) between baseline scores and seven-week follow-up scores with means decreasing over time indicating less fear.

The means and standard deviations for the PANAS hostility subtest are reported in Table 5 and Chart 3. The results for the ANOVA indicated no significant interactions $F(1,44) = 3.47, p = .07$. Researchers found a significant main effect across time, $F(1,44) = 14.77, p < .001$, partial $\eta^2 = .251$.

The means and standard deviations for the PANAS guilt subtest are reported in Table 6 and Chart 4. The results for the ANOVA indicated no significant interactions $F(1,46) = 1.46, p = .23$. Researchers found a significant main effect across time, $F(1,46) = 9.76, p < .001, \text{partial } \eta^2 = .175$.

Researchers conducted repeated measures ANOVA for the PANAS sadness subscale. The means and standard deviations for the PANAS sadness subtest are reported in Table 7 and Chart 5. The results for the ANOVA indicated no significant interactions $F(1,46) = .28, p = .63$; however, we found a significant main effect across time, $F(1,46) = 10.24, p < .01, \text{partial } \eta^2 = .182$.

The means and standard deviations for the PANAS attention subtest are reported in Table 8 and Chart 6 and are reported in Table 9 and Chart 7 for the PANAS shyness subtest. The results for the repeated measures ANOVA indicated no significant interactions for either subtest $F(1, 46) = 1.35, p = .25$ for the attention subtest interaction and $F(1,47) = .73, p = .40$ for the shyness subtest interaction. Researchers found a significant main effect across time, $F(1, 46) = 8.82, p < .01, \text{partial } \eta^2 = .161$ for the attention subtest and $F(1, 47) = 9.83, p < .01, \text{partial } \eta^2 = .173$ for the shyness subtest.

The means and standard deviations for the PANAS fatigue subtest are reported in Table 10 and Chart 8. The results for the ANOVA indicated no significant interactions $F(1,46) = .06, p = .81$; however, we found a significant main effect across time, $F(1,46) = 8.35, p < .01, \text{partial } \eta^2 = .154$.

The repeated measures ANOVA indicated no significant interactions between group and time and no significant main effects across time for the PANAS positive affect scale and all other PANAS subtests.

Researchers conducted repeated measures ANOVA with the factor being the Pennebaker Inventory of Linguid Languidness (PILL) at each time of the five time periods and the dependent variable being the outcome scores of the measurement. The means and standard deviations for the PILL are reported in Table 11 and Chart 9. The results for the ANOVA indicated no significant interactions $F(1, 43) = .73, p = .40$; however, we found a significant main effect across time, $F(1, 43) = 26.00, p < .001$, partial $\eta^2 = .377$.

Biometric Measures

Participants provided cortisol measurements at two different time frames. The first measurement was completed following the first day of writing. The second cortisol measurement was taken following the third day of writing. A repeated measures ANOVA indicated no significant interactions $F(1, 36) = .82, p = .37$ and no significant main effects $F(1, 36) = 2.28, p = .14$ for cortisol level across time. Researchers compared only the participants who completed the cortisol measurement on both days. The means and standard deviations of cortisol levels for each group are reported in Table 12 and Chart 10.

Participants provided blood pressure and heart rate measurements at baseline after completing the questionnaire packet. Researchers collected both measurements immediately after writing for all other days. The difference in systolic blood pressure

was not significant for the groups. There was a significant interaction between the groups for diastolic blood pressure with group 1 showing increased blood pressure following the first writing day. There was no significant interaction between the groups for heart rate $F(1, 63) = .56, p = .46$; however, a main effect of time was found for group 1 with an increase in heart rate at the seven-week follow-up period.

CHAPTER VII - DISCUSSION

There was a consistent, reliable, robust effect across multiple measures; however, the effect was related to number of exposures, not to whether the exposures were designed to be effective therapeutically. Both experimental exposure, therapeutic writing, and the placebo control procedure had significant, robust effects across number of exposures and across multiple dependant variables. This Hawthorne effect (Adair, 1984; Roethlisberger & Dickson, 1939), participants changing their behavior due to the knowledge that they are participating in an experiment, creates considerable difficulty in discerning what, in fact, are the effective elements of therapeutic writing. As E. G. Boring once commented, “a fact is a difference” and, in this study, the anticipated difference was to be between the trauma therapeutic writing compared to the control writing task. Finding an effect of exposure to the general experimental process was not anticipated. In addition, the demand characteristics of the experiment may have influenced the outcome. The demand characteristics, social cues or expectations that are inherent in social contexts which can influence behavior or self-reported experiences, may have increased the response to the writing task itself rather than to the anticipated therapeutic nature of the task (Orne and Whitehouse, 2000).

Characteristics of Sample

The sample included women inmates who were incarcerated for an array of legal infractions. All women were able to read at a sixth grade level or above and all gave

consent for participation without coercion. The length of sentence varied widely from 1 year to life in prison without the possibility of parole. The samples were statistically indistinguishable in terms of type (physical or sexual), duration, and severity of abuse histories. Most of the women had multiple abuse incidents ranging from verbal abuse to being hit, punched, slapped or kicked, to sexual molestation and rape. The experimental and control groups reported approximately the same level of PTSD symptoms at baseline. Based on the PCL, 63.3% of the participants scored a 40 or above, indicating significant PTSD symptomatology at baseline. In addition, many of the women also reported significant substance abuse histories before entering the prison setting.

In analyzing the writing content, all of the participants in the trauma-writing group wrote about either an event meeting criteria A for PTSD, or if not meeting criteria A, the traumas were clearly emotionally stressful and replete with psychological difficulties. For example, one participant wrote about three separate traumas on each writing day including being rape, enduring childhood sexual abuse, and being severely beaten, which ended with her committing murder. These types of stressors were the norm rather than the exception. One of the undoubted strengths of the current research is the sample examined. Most previous studies involved college students who were participating for extra credit in a class. The number and severity of the traumas discussed by the participants in this study are more likened to a clinical population and, thus, more generalizable to individuals who might be receiving psychological services.

The most powerful result in the study was the significant main effect over time found on most of the outcome measures. This consistent decrease in symptoms and other

indices of functioning from baseline to 7 week follow-up could be due to several factors. The acclimation to the writing task could account for the decrease. In a chronically and unrelentingly stressful environment such as a prison, knowing expectations for a task and becoming familiar with the researchers may have been influential in the decline of symptoms. This would have been more feasible if initial exposure to the experimental tasks produced high levels of distress/anxiety. In relation to this hypothesis, the initial writing task was expected to demonstrate an elevation in scores due to the both the newness of the task and the researchers as well as the emotional confrontation of the traumatic event by writing about it, possibly for the first time. However, a significant increase between baseline scores and Day 1 writing scores was not found for either group.

Researchers did not find a significant increase in scores due to the elevated stress levels present during both the baseline and the Day 1 testing sessions. The first day of writing presented a new task not similar to the baseline measurements. Therefore, no differences were found until after the writing had taken place multiple times, which may account for the steady decline in scores as time passes without a significant difference being seen until the follow-up period. The initial stress properties produced as a result of the task could be expected to decrease over time, which is consistent with the hypothesis of demand characteristics influencing the data for both groups.

Another possible contributing factor to the decline in scores may have been the emotional processing that took place during the writing period. Rather than acclimating to the writing task, participants were able to process emotionally the traumatic events

about which they were writing. Both groups tended to show a steady decline over time in their scores with the trauma-writing group having typically lower scores on every measurement. Researchers asked the control group to write about what they did the previous day as objectively as possible without using emotional words. Some of the participants wrote in the third person to further distance themselves emotionally from the writing process. Even though researchers derived the instructions using previous research standards (Pennebaker et al., 1988), the previous days' events may have been stressful for many of the participants given the setting of the research.

A prison setting is stressful in and of itself, so the participants, even those who are accustomed to prison life, tend to have elevated stress levels simply due to the high stress environment. Therefore, writing about the tasks of the previous day for the control group may have actually allowed them to process a stressful event rather than what was anticipated to be an objective, mundane topic. The standard instructions of the expressive writing paradigm (Pennebaker et al., 1988) may not be adequate in this setting. Given that the previous day's activities for the control group are laden with stress and not objective recalls of nonthreatening information as supposed, the control group's decrease in scores across time may have been influenced by writing about the previous day's activities. The emotional processing of the traumatic event for the experimental group may have contributed to the slight difference in the group scores whereas both groups benefited from the writing task itself since both may have been writing about stressful events, whether from the previous day's activities or from pre-prison stressors.

Psychological and Physiological Measurements

The psychological impact of emotional writing has been well documented (e.g., Richards et al., 2000; Batten et al., 2002). Writing about previous traumatic experiences has been found to help individuals to decrease symptom load and to increase their psychological well-being. Reductions in depression, anxiety, and PTSD symptoms have all been noted in the literature (Brown & Heimberg, 2001; Lepore, 1997; Schoutrop et al, 2002). Researchers predicted the experimental group to show initial increases in psychological symptoms after the first day of writing and a gradual decrease of symptoms on writing days 2 and 3. Symptoms also were predicted to decline significantly at follow-up as compared to the control group. However, both groups showed a trend towards an increase in psychological symptoms following the first day of writing, followed by consistent decreases over time. Previous research findings (i.e., Marx & Sloan, 2004) indicate that decreases in anxiety, depression, and overall psychological well-being result from the expressive writing condition. In addition to the decreases in psychological symptoms, psychophysiological indices have been shown to be positively affected by the expressive writing paradigm.

Based on other studies conducted with individuals in high stress situations, (e.g., Richards et al., 2000) a difference between the trauma-writing group and the control group was expected for both psychological and physiological measurements. The results demonstrated no significant effect of type of writing between the two groups on either psychological or physiological measurements.

Researchers anticipated the physiological measurements to be a reliable indicator of stress. Thus, they expected cortisol levels to decrease for the experimental group at post-test with no change expected for control participants. However, once again, a decline in salivary cortisol was obtained for both groups. As cortisol is a fast-acting agent, taking measurements at follow-up might not have shown the long-term effects of the writing task. However, the decrease for both groups indicates that whatever the nature of the writing task, researchers observed a reduction in the amount of stress-related hormones. This finding adds support to the general interpretation that the effects were intervention and attention, not specific to trauma writing. The trauma-exposed writing group reduced the amount of cortisol production possibly because they released the mental energy required to inhibit the thoughts of the trauma. By disinhibiting, they may have been able to emotionally process the information and showed more significant declines in their hormonal stress levels.

Researchers expected the participants in the experimental group to have elevated heart rate and blood pressure levels following the writing task for days 1 and 2. Researchers hypothesized the physiological measurements to decrease following the writing task on day 3 and decrease further at follow-up. They expected no change in the control group. Also, researchers expected the measurements to be higher among the experimental group than the control group.

There were no significant interactional effects for heart rate or for systolic blood pressure. There was a main effect for diastolic blood pressure levels between the groups. There was also a main effect of time for the experimental group with an increase in heart

rate at the follow-up period. The increase in heart rate may have occurred at follow-up due to the anticipation of further analyses after habituation to the task occurred during the four consecutive testing days. After a delay of 7 weeks, the presentation of the researchers may have evoked a small stress response of increased heart rate.

There were no significant differences on psychological or physical symptoms between the groups indicating that the results were a function of exposure to the task of writing and of time rather than of the type of writing task. Although the experimental group demonstrated a marginally greater reduction in symptoms, the difference was not statistically significant. The marginal difference, rather than a more robust finding, may have due in part to the location of the experiment, as discussed above due to the innate stressfulness of a prison. Perhaps, the experimental group would have shown greater reduction of symptoms if placed in a setting where vulnerability is not a potential danger. If the participants allowed themselves completely to be emotionally vulnerable while conducting this task, they may have experienced the task as putting themselves at greater risk given the violent nature of the setting. Further exploration about the impact of the setting in which the trauma is addressed should be encouraged by future researchers. Because both groups were equal for trauma exposure and severity, the slight difference found between the groups may be enhanced in a less threatening writing environment.

The hypothesis that emotional writing operates as a mediator for stressful experiences, but does not have a significant impact on more severely traumatized individuals may have been a factor in the results of this study, as also demonstrated by Battan et al. (2002). Just as Battan et al. (2002) reported no significant effects of writing

on the physical health of female sexual abuse and rape survivors, the high level of PTSD symptoms in the current sample may be a possible explanation for the lack of significant differences between the groups on most measures in the current study.

Across most of the psychological measures, researchers found a significant decline for both groups; however, they observed a trend that the trauma writing group showed a non-statistically significant greater decline. Researchers hypothesized the baseline measurements to be equivalent for both groups on psychological measurements, with a distinction between the groups becoming evident throughout the consecutive writing days. The expected interaction did not occur, however, the significant effect of time is important to consider and evaluate.

The Hawthorne effect (Roethlisberger & Dickson, 1939) is one possible explanation for the demonstrated results. All participants were aware that observation was taking place while they were writing. The awareness that their behavior was under observation may have influenced and changed their behavior. Knowing that others, with whom the participants interacted on a daily basis, were present and possibly watching their behavior as well may have influenced their willingness to place themselves in a vulnerable position. It may be unsafe to be vulnerable emotionally in a prison environment. Thus, the women in the trauma writing group may be less likely to discuss emotionally their traumatic events. Even while writing about the event, the participants may have maintained emotional distance and reduced their vulnerability. Therefore, the likelihood that the participants from both groups changed their behavior congruently is consistent with the findings. Participants from both groups may have monitored their

behaviors due to the observation of the researchers and the other participants, so both groups demonstrated a reduction in symptoms over time once habituation occurred. However, because the experimental group was aware of being observed, they may not have processed the writing task emotionally any different than the control group. The significant effect of time on symptom reduction may have occurred as a function of habituation to the researchers' presence and the writing task itself for both groups.

Another possible explanation for the lack of an interactional effect is that the women were meeting the demand characteristics placed on them simply by their participation. The expectation that they were supposed to perform in a certain manner may have influenced the outcome. Again, the environment in which they are participating may have impacted their willingness to adhere to the expectancy of the study. One of the most important factors in a suppressed environment is maintaining control. Prisoners quickly learn to conform to certain rules, policies, and instructions or reap the ensuing repercussions. Thus, they may have followed the instructions of the experimenter, even without coercion, in order to avoid possible penalties. With these demand characteristics placed on the participants, participants of both groups may have performed the writing task in anticipation of the experimenter's expectations. The women may have answered the self-report questionnaires with decreased symptomatology if they believed that was the expectation of the experimenter. If both groups performed in this manner, they may have both shown improvement over time, rather than the trauma writing group showing significant reduction in symptoms. These

demand characteristics are hypothesized as one possible explanation for the lack of an interaction while maintaining the decreased symptoms over time for both groups.

A third possible hypothesis for the psychological outcome measurements is simply the lack of power in the sample size. The trauma writing group displayed a trend of fewer symptoms than the control group over time. Both groups had a significant decline in psychological and physical symptoms over time, but the difference between the groups was not significant. With additional participants, the difference between the groups may have been significant. The initial number of participants appeared to be adequate to demonstrate the desired effects; however, with the participants who were paroled, transferred, work released, or chose not to continue with the follow-up phase, the power was decreased. With more participants, the difference in the effects of the expressive writing may have been more pronounced, and thus significant.

Future Directions

The lack of significant difference between the groups' raises the question of into what is the writing task truly tapping. Does the writing paradigm, as established by Pennebaker, tap into the emotional processing needed to see significant differences in individuals who have undergone severe traumatic events? Battan et al. (2002) reported finding no significant effects for survivors of rape and sexual abuse. Given the highly anxiety-provoking setting of the prison and the significant trauma histories of the participants, the lack of difference between the control and experimental groups may be a function of an inability to process the emotional underpinnings of the writing in a vulnerable setting. In addition, the participants were in a room with 5-15 other

participants at a given time. Even though they were separated to allow for confidentiality, the knowledge that other, potentially threatening, individuals were around may have made the participants less willing to internalize the emotions about which they were writing. Upon examination of the writing content, the women followed the instructions to write about the most traumatic event they had experienced. However, they may not have allowed themselves to connect with the writing on an emotional level.

An area of further exploration would be to include individuals who were able to write in a secluded area with time to process the emotions following the 20 minute writing interval. Taking the physiological measurements immediately following the writing task and then again after having the individual sit for 20 minutes thinking about or talking about their writing with a trained professional may demonstrate more effects because it would give the participants time to process the information without having to maintain the emotional disconnect to protect themselves from vulnerability from the other participants.

The setting may have presented another potential problem in seeing the effects hypothesized. The prison creates anxiety and therefore, increased physiological arousal. Thus, the participants' subjective ratings of their emotional status may have been influenced by the prison environment. In addition, the physiological measurements may have been inflated initially due to the continuous level of heightened arousal. The heart rate, blood pressure levels, and cortisol levels may stay at an elevated state and thus less effect from the writing task was evident because the participants were already experiencing increased arousal.

There is the possible confound of conducting stress research in a high stress situation. For the participants to allow themselves to be vulnerable enough to process the trauma is not conducive to survival in a maximum security prison. The heightened arousal may be a function of the environment in addition to the task itself. The potential cause for the lack of significant differences between the groups may be further studied by providing a third group with a control condition of no writing. In addition, having a second control-writing group in which the participants write about an event not related to the high stress environment, such as how to make a sandwich rather than the previous day's activities, may be beneficial. Allowing participants to write about a benign topic, outside of the prison activities, would allow the difference between trauma-writing and control writing to be demonstrated more clearly given that the previous days' activities may have been stressful, if not traumatic.

Sloan and Marx (2004) discussed the importance of the number of writing sessions in the exposure to traumatic writing. If, as Foa and Kozak (1986) state, cognitive changes mediate the fear reductions observed during exposure, participants with more severe psychopathology may require more than the typical 3-4 sessions of exposure before significant results are demonstrated. The established protocol may work best for those with low to moderate levels of symptomatology and may only increase negative emotional associations for those with more severe traumatic events. Thus, future researchers may need to examine the effects of the exposure writing paradigm on clinical populations with more significant trauma histories using more writing sessions or writing periods longer than the standard 20 min.

The Hawthorne effect has been demonstrated to influence study effects simply because of the novelty of the task (Adair, 1984). Allowing a multiple baseline contact would better control for this possible confound. The participants would complete a series of surveys about different topics. Some of the surveys would pertain to the study, others would not. Therefore, the participants would be unaware of the surveys being used in the study and they would also become accustomed to answering the questions. After a brief period, the effects of the newness of the task would be diminished and the results would be an accurate representation of their emotional and physical well-being. However, further consideration would need to be taken with the same dilemma in the writing procedure itself. In order to follow Pennebaker's (1989) protocol, the writing task would only take place for 3 to 4 consecutive days. Even if the participants completed the questionnaires at multiple baseline measurements, the writing task itself could serve as a novel stimulus and change the outcome of the results. If allowed to write for more than three to four days to control for the Hawthorne effect, the writing protocol would have been altered. One possible solution is to have multiple contact baseline with completing both surveys and writing for both the trauma-writing and non-trauma-writing groups and completing only surveys for both groups. This procedure would allow for the difference between the groups to be reviewed more precisely. A much larger sample size would be needed to complete this task.

Thus, another consideration for future research is the number of participants. The initial amount of participants was satisfactory to determine differences between the groups. With participants being released, moving to work release programs, being

transferred to other prisons, and entering substance abuse treatment programs, the final number of participants was reduced. The trends toward a decline in negative symptoms may have reached significant levels with more participants.

A final consideration for future research is to examine the level of trauma of the participants. Categorizing the type and severity of the trauma exposure may indicate a difference in the scores. The participants who had experienced significant traumas compared to those who had minor stressors may have shown a difference in their scores. Because the severity of their trauma was not specifically questioned and a PTSD diagnosis was not ascertained, a determination regarding the impact of writing on individuals with a PTSD diagnosis and severe trauma exposure versus those with no PTSD diagnosis and less severe trauma could not be made. This information would be a valuable assessment in examining the effectiveness of the writing paradigm with a more traumatized population.

There appears to be a trend towards a significant decline from baseline measurements to the 7-week follow-up in both psychological and physical symptoms for the trauma writing group. There are several possible explanations for this trend. The act of writing itself has demonstrated cathartic characteristics in traumatized populations (Lepore et. al., 2002). The participants in this study reported a significant level of traumatic incidences and may have benefited from the writing paradigm itself. Another possible explanation is that writing about difficult circumstances in their past allows the trauma-writing group to release both emotional and physical energy that was previously being used to resist thinking about and feeling the trauma. The release of this energy

allowed the participants to enhance their physical well-being such as immune functioning, heart rate, blood pressure levels, and stress levels as measured by salivary cortisol. In addition, their psychological well-being also may have been positively impacted by the lack of mental inhibition previously required to distance them from thinking about the trauma. By allowing themselves emotionally to connect and think about past traumatic events, the participants released mental energy used previously to suppress these thoughts.

Overall, the results from this study indicate that writing plays some cathartic role in coping with traumatic events. Although the differences between the expressive writing group and the control group were not significant, both psychological and physiological symptoms reduced over time. The actual process of how this change occurs remains unknown. An increase in the number of writing sessions or duration of writing time may have made the difference between the groups significant given that participants with more severe traumatic histories may require longer exposure time to reduce the negative emotional associations with the writing task. The possibility that the participants reported reduced symptoms because of demand characteristics also was hypothesized. In addition, the change in behavior may have occurred because the participants were aware of the observation of their behavior taking place. Simply having this knowledge may have influenced the reported symptomatology over time. Finally, the number of participants who completed the project through the follow-up period may not have allowed for adequate power in determining if a significant difference was present between the two groups. With more representation in both groups, the effects of

expressive writing rather than control writing may have produced significant effects rather than non-significant trends. Further exploration by trauma researchers is needed to clarify the process of emotional coping through expressive writing.

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Table 1.

Means and Standard Deviations for ERQ

	ERQ Tot			ERQ Sup			ERQ Rea		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control (1)	44.4	39	11.0	16.0	40	5.2	28.0	40	7.8
Experimental (2)	46.4	40	11.2	16.3	41	5.6	30.1	40	8.3
Total	45.4	79	11.1	16.2	81	5.4	29.1	80	8.1

Table 2.

Means and Standard Deviations for PTSD Checklist

	PCL 1 Total			PCL 6 Total		
Group	Mean	N	SD	Mean	N	SD
Control (1)	48.5	40	15.7	42.6	27	14.8
Experimental (2)	47.5	39	17.2	37.8	22	13.5
Total	48.0	79	16.3	40.4	49	14.3

Table 3.

Means and Standard Deviations for PANAS – Negative Affect

	PAN-NA1			PAN-NA2			PAN-NA3			PAN-NA4			PAN-NA6		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	26.2	41	9.2	26.4	41	9.1	24.7	40	9.8	24.1	39	10.2	22.5	27	10.0
Exper.	25.5	41	7.9	25.7	40	8.6	24.7	38	9.3	23.1	36	8.5	20.0	23	8.8
Total	25.9	82	8.5	26.1	81	8.8	24.7	78	9.5	23.6	75	9.4	21.4	50	9.5

Figure 1. PANAS – Negative Affect

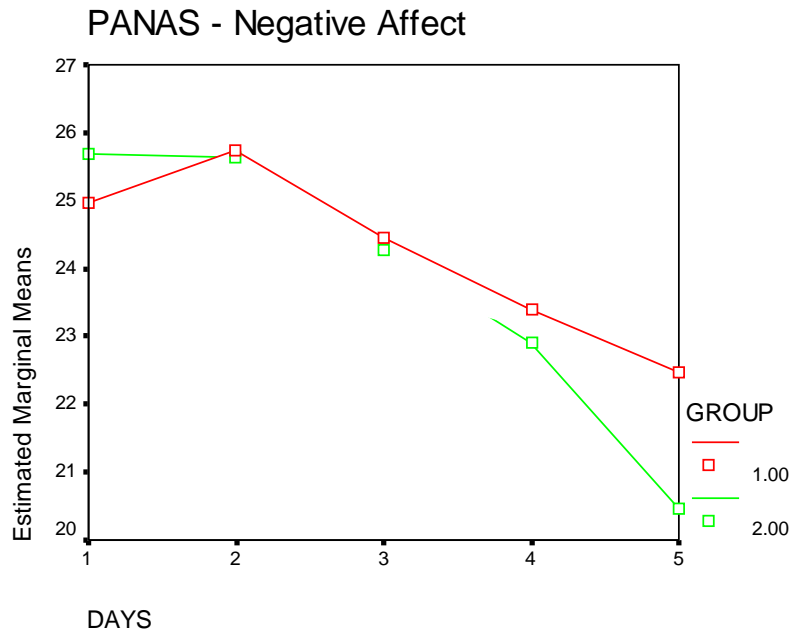


Table 4.

Means and Standard Deviations for PANAS – Fear

	PAN-F1			PAN-F2			PAN-F3			PAN-F4			PAN-F6		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	14.0	41	6.1	13.3	41	6.0	12.7	40	6.0	12.2	39	5.9	11.8	27	5.5
Exper.	12.9	41	4.7	12.6	41	5.3	12.2	38	5.8	11.9	36	5.7	10.7	23	5.5
Total	13.4	82	5.4	13.0	82	5.6	12.4	78	5.9	12.0	75	5.8	11.3	50	5.5

Figure 2. – PANAS - Fear

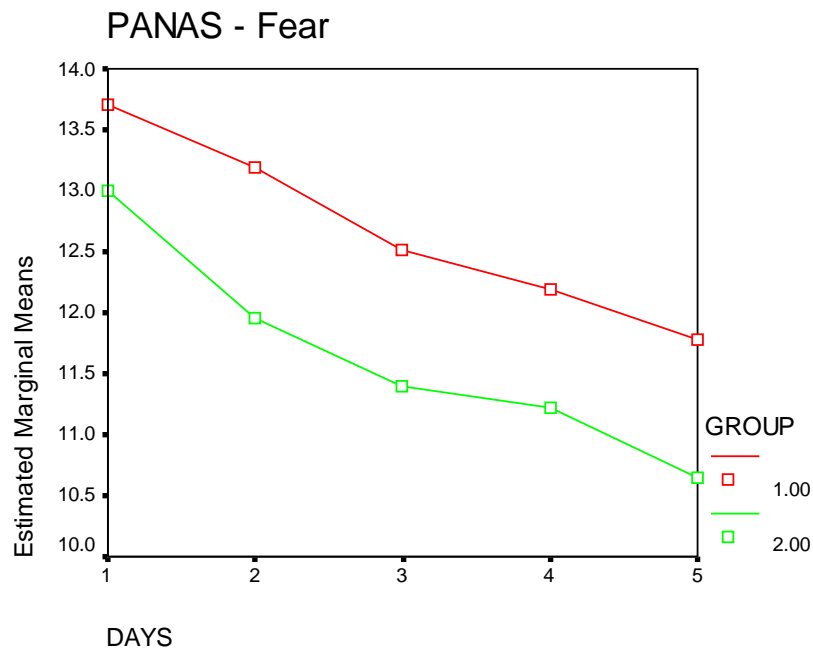


Table 5.

Means and Standard Deviations for PANAS – Hostility

	PAN-Hos1		PAN-Hos2		PAN-Hos3		PAN-Hos4		PAN-Hos6						
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD			
Control	15.9	40	5.8	16.1	40	5.9	15.2	39	6.7	14.5	39	6.6	13.3	27	6.0
Exper.	15.0	41	5.8	15.6	39	6.5	14.5	38	6.2	13.8	36	6.4	11.2	23	6.0
Total	15.4	81		15.9	79		14.8	77		14.2	75		12.3	50	

Figure 3. PANAS - Hostility

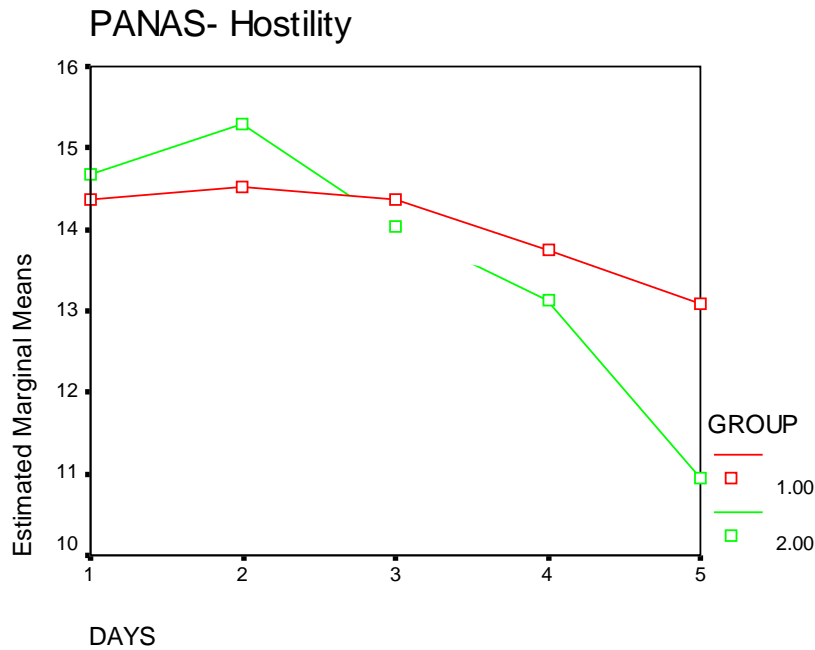


Table 6.

Means and Standard Deviations for PANAS – Guilt

	PAN-Glt1		PAN-Glt2		PAN-Glt3		PAN-Glt4		PAN-Glt6			
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	17.7	41	7.6	18.8	40	7.9	17.2	40	8.6	17.3	39	8.8
Exper.	18.2	41	6.2	18.2	41	6.9	18.3	37	7.4	16.4	35	7.1
Total	18.0	82	6.9	18.5	81	7.4	17.8	77	8.0	16.9	74	8.0

Figure 4. PANAS – Guilt

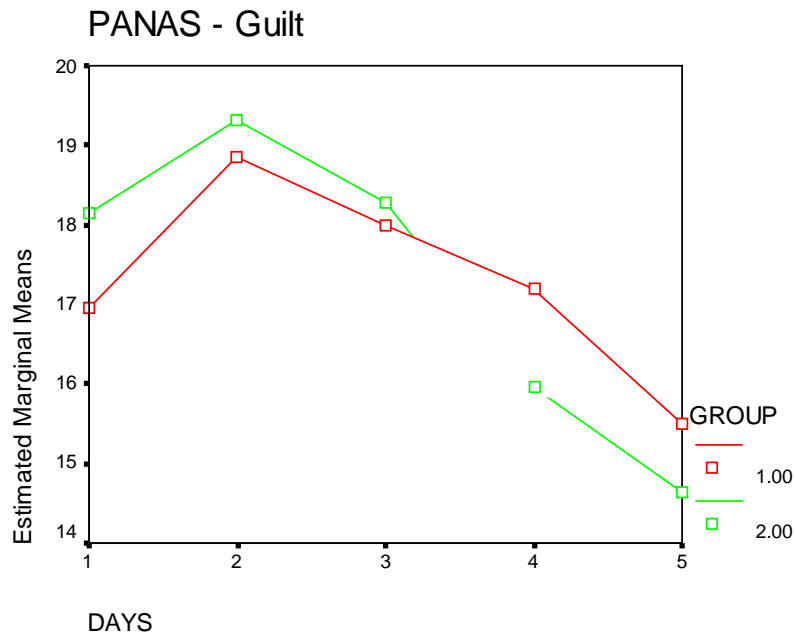


Table 7.

Means and Standard Deviations for PANAS – Sadness

	PAN-Sad1			PAN-Sad2			PAN-Sad3			PAN-Sad4			PAN-Sad6		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	15.6	41	5.2	16.2	41	5.5	15.4	40	5.7	15.2	39	6.0	13.3	27	5.4
Exper.	14.8	40	4.9	15.0	41	5.8	15.0	38	5.9	13.4	36	6.0	12.2	22	5.2
Total	15.2	81	5.0	15.6	82	5.7	15.2	78	5.8	14.3	75	6.0	12.8	49	5.3

Figure 5. PANAS – Sadness

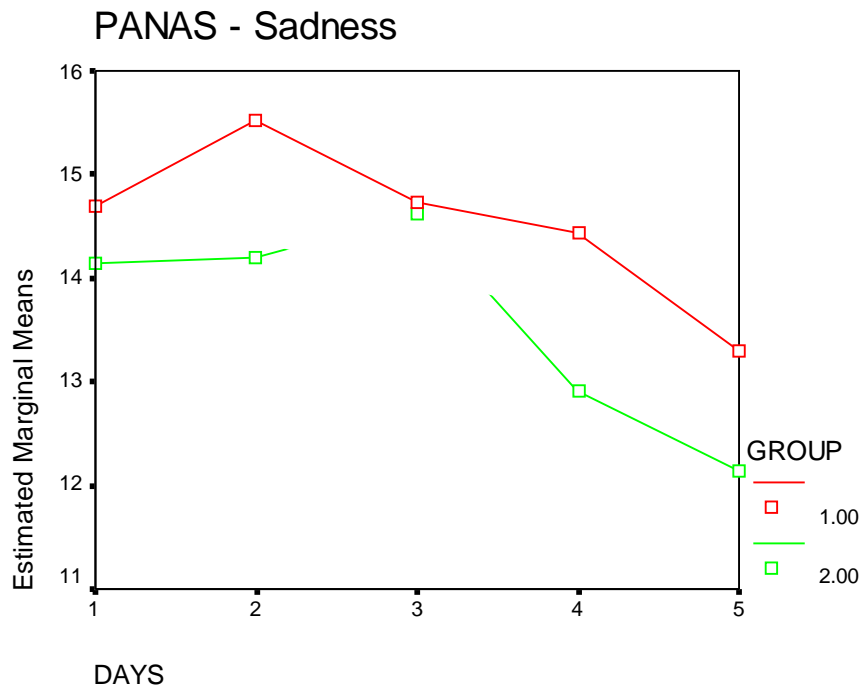


Table 8.

Means and Standard Deviations for PANAS – Attention

	PAN-Att1		PAN-Att2		PAN-Att3		PAN-Att4		PAN-Att6						
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD			
Control	11.8	41	4.1	11.9	41	4.3	11.0	39	5.1	10.8	39	4.5	10.6	27	4.2
Exper.	11.0	40	4.0	10.7	41	4.4	11.3	38	4.1	11.1	36	4.2	10.7	23	4.1
Total	11.4	81	4.1	11.3	82	4.4	11.0	77	4.6	11.0	75	4.3	10.6	50	4.1

Figure 6. PANAS – Attention

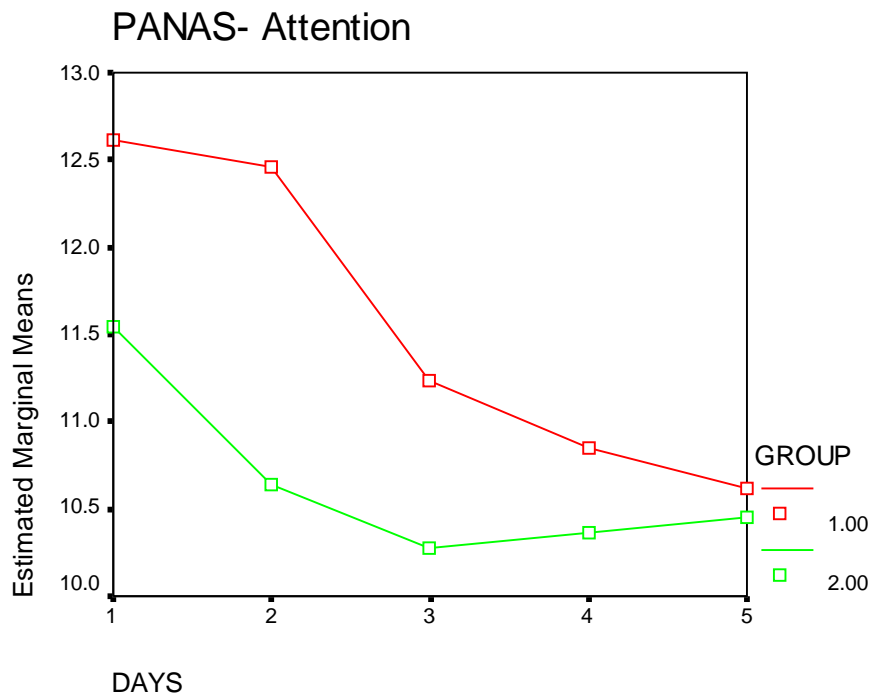


Table 9.

Means and Standard Deviations for PANAS – Shyness

	PAN-Shy1			PAN-Shy2			PAN-Shy3			PAN-Shy4			PAN-Shy6		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	8.2	41	3.3	8.1	41	3.8	7.3	40	3.8	7.8	39	3.9	6.7	27	3.0
Exper.	7.0	41	3.2	6.7	40	2.9	7.1	38	3.4	6.4	36	3.0	6.3	23	3.5
Total	7.6	82	3.3	7.4	81	3.4	7.2	78	3.6	7.2	75	3.6	6.5	50	3.3

Figure 7. PANAS – Shyness

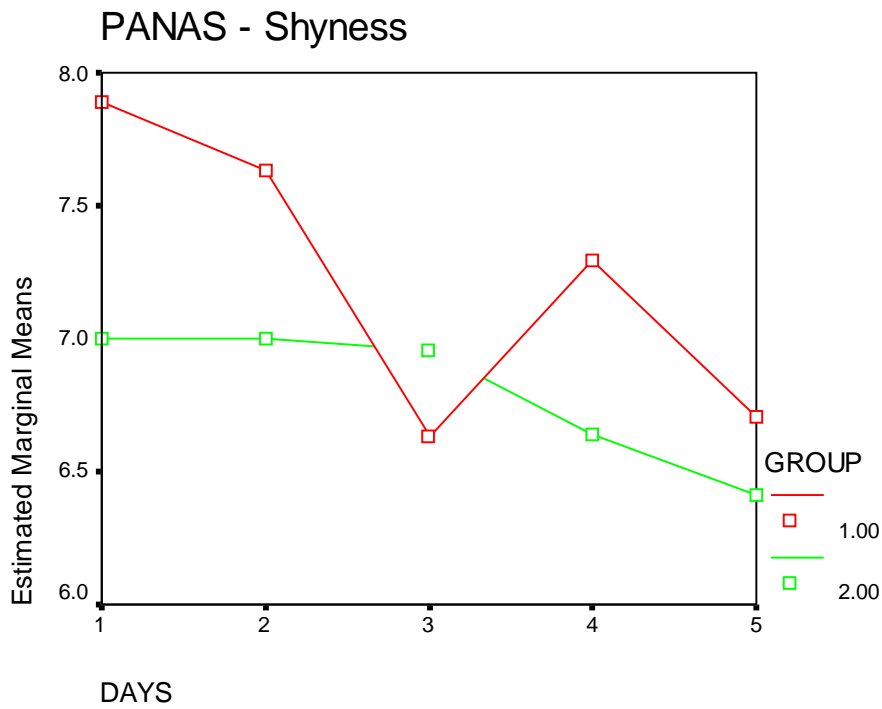


Table 10.

Means and Standard Deviations for PANAS – Fatigue

	PAN-Fat1			PAN-Fat2			PAN-Fat3			PAN-Fat4			PAN-Fat6		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	11.8	40	4.1	12.0	41	4.3	11.3	40	4.4	11.1	39	4.6	9.7	27	4.1
Exper.	10.3	41	4.2	10.4	40	4.4	10.1	38	4.5	9.8	36	4.4	8.2	23	4.5
Total	11.0	81	4.2	11.2	81	4.4	10.7	78	4.4	10.5	75	4.5	9.0	50	4.3

Figure 8. PANAS – Fatigue

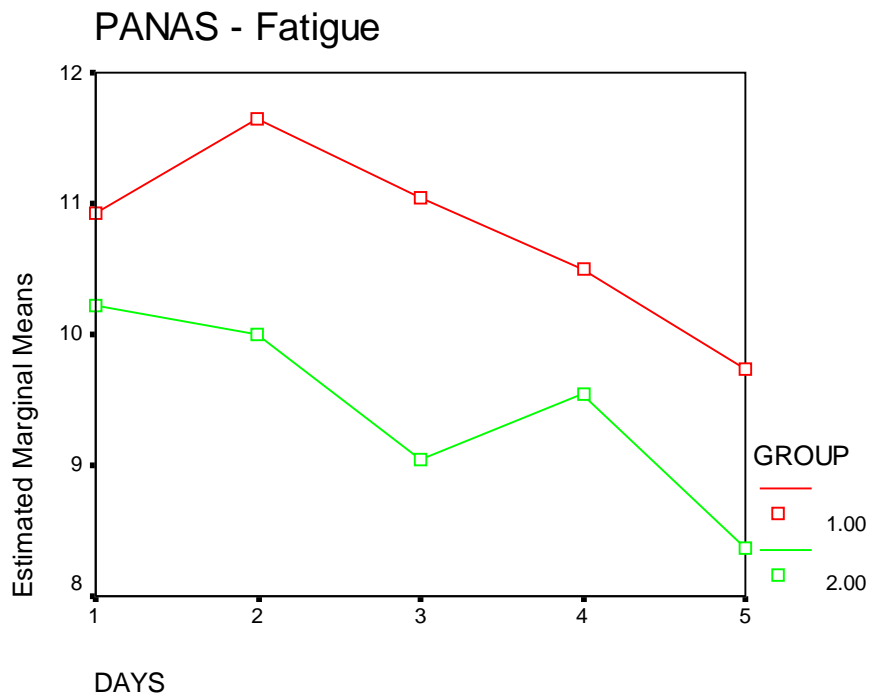


Table 11.

Means and Standard Deviations for Pennebaker Inventory of Linguid Languidness

	PILL-1			PILL-2			PILL-3			PILL-4			PILL-6		
Group	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD	Mean	N	SD
Control	138.5	40	45.9	127.9	40	41.9	125.5	39	46.0	123.2	37	48.3	116.6	27	40.7
Exper.	133.2	39	32.8	122.6	40	35.4	121.0	38	35.6	116.6	36	37.1	112.1	22	29.5
Total	135.9	79	39.8	125.3	80	38.6	123.3	77	41.0	120.0	73	43.0	114.6	49	35.8

Figure 9. PILL

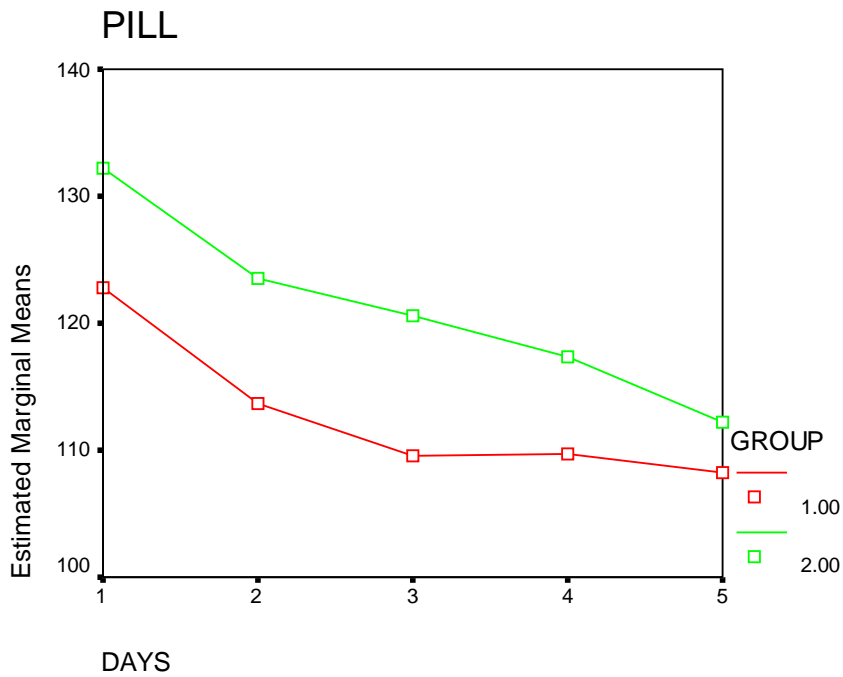
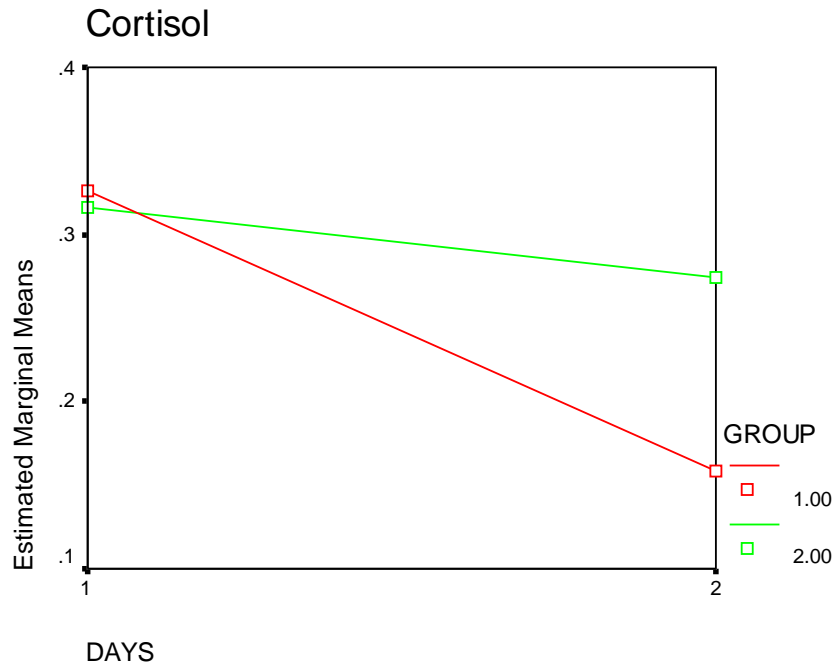


Table 12.

Means and Standard Deviations for Cortisol

Group	Cortisol-1			Cortisol-2		
	Mean	N	SD	Mean	N	SD
Control (1)	.32	20	.52	.22	38	.23
Experimental (2)	.34	22	.34	.29	32	.25
Total	.33	42	.43	.25	70	.30

Figure 10. Cortisol



APPENDICES

Code Number _____

Demographics Questionnaire

1. **Race - Circle One:** White (Non-Hispanic) African-American Hispanic
Asian American Indian Other (Specify): _____

2. **Age:** _____ 3. **Years of Education:** _____

4. **Age at first criminal conviction:** _____

5. **Years since current crime committed:** _____

6. **Years since incarcerated for current crime:** _____ years _____ months

7. **Total number of time incarcerated:** _____ years _____ months

8. **Was your offense _____ violent or _____ non-violent?**

9. **# of children:** _____

10. **# of children incarcerated?** _____

11. **# of adult family members incarcerated?** _____

12. **Have you gone through menopause?** _____ yes _____ no

_____ currently going through menopause

13. **Are you taking estrogen replacement therapy?** _____ yes _____ no

14. **Are you taking ANY medications?** _____ yes _____ no

If yes, please list: _____

15. **Do you have any medical conditions?** _____ yes _____ no

If yes, please list: _____

16. **Do you smoke cigarettes?** _____ yes _____ no

If yes, how much do you smoke daily?

17. **Were you using drugs or alcohol when arrested?** _____ yes _____ no

INFORMED CONSENT FOR

Writing as a Coping Mediator Between Trauma and Psychological and Physical Health

You are invited to participate in a study of “Writing as Coping Mediator Between Trauma and Psychological and Physical Health” to be conducted by Barry Burkhart, Professor of Psychology, and Jennifer Daniels, a Clinical Psychology graduate student at Auburn University. We hope to learn more about using writing with emotional language as a positive way to cope with past traumatic events in order to increase mental and physical well-being. You were selected as a possible participant in this study because you are female, incarcerated, and are 19 years of age and older.

If you decide to participate, I will ask you for physical measurements including heart rate, blood pressure, and saliva samples to obtain cortisol levels. Cortisol level is a good indicator of how much stress your body is under. Your saliva samples will be used for testing cortisol ONLY. You will also be asked to fill out a demographics sheet and several questionnaires about your physical and mental health. You will then be asked to write for 20 min for 3 days on an assigned topic. You may be asked to write about traumatic events in your past or you may be asked to write about something you do everyday. I will follow-up with you 6-weeks after the first session and will take the same physical measurements and ask you to answer the same questionnaires. The total time commitment if you complete all phases of the study is approximately 9 hours. You will not receive any compensation for your participation. There are slight foreseeable risks to your participation in this study. Since you might be asked to write about traumatic events in your past, there is a slight possibility that you will feel psychological discomfort. Steve Goodwin, M.S. is available to assist you during or after the study. He can be contacted at (334) 567-4369 or by setting up an appointment with him in his office located in the cafeteria. You will also be asked to give consent for access to your infirmary records to see how many times and for what reasons you sought treatment.

As a result of this research, we hope to learn whether writing using emotional words is a positive coping technique to decrease psychological problems and increase physical health. Previous research in this area has shown beneficial effects for many groups of people, but incarcerated women with traumatic histories have not been studied. We hope that you will be able to continue using the techniques you learn in this study to assist you in coping with past trauma after the study is complete. However, I cannot promise that you will receive any or all of these benefits.

Participant's Initials

Page 1 of 2

Any information in connection with this study will remain confidential. Only individuals connected with this project will have access to your information. You will be asked to use a code name on all testing materials, and your name will not be placed on any of the testing materials. Your AIS # will be coded with your study code number on a separate sheet of paper to ensure confidentiality.

Although Tutwiler Women’s Prison has given consent for me to conduct the research, you are under no pressure to participate. There will be no negative outcomes from the experimenters, Auburn University, or the prison officials if you choose not to participate. You may choose not to participate in the research at any time. You may withdraw any data which has been collected about you as long as that data is identifiable. Information collected through your participation may be used to fulfill an educational requirement, published in a professional journal, and/or presented at a professional meeting. If so, none of your identifiable information will be included.

If you have any questions before, during, or after this research, I may be contacted by phone at 334-844-4412. Dr. Barry Burkhart may be contacted by phone at 334-844-4412 or by regular mail at Psychology Department, Auburn University, AL 36849-5214. For more information regarding your rights as a subject you may contact the Office of Human Subjects Research or the Institutional Review Board by phone (334)844-5966 or email at hsubjec@auburn.edu or IRBChair@auburn.edu. You will be provided a copy of this form to keep.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER TO PARTICIPATE IN THIS RESEARCH PROJECT. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

_____ Participant’s Signature	_____ Date	_____ Investigator obtaining consent	_____ Date
_____ Print Name		_____ Print Name	

Confidentiality Agreement

Writing as a Coping Mediator Between Trauma and Psychological and Physical Health

I agree to maintain confidentiality as outlined in the ethical guidelines of the American Psychological Association. I have received and read a copy of these guidelines and have been trained on these guidelines by an advanced clinical psychology graduate student. I will not discuss the research participants, data collected, or any other information deemed confidential under the guidelines with anyone not directly involved in the research project.

I also agree to uphold the ethical standards in working with vulnerable populations as described in the code of regulations by the National Institute of Health. I have received and read a copy of these guidelines and have been trained on these guidelines by an advanced clinical psychology graduate student.

By signing this form, I agree to uphold the above principles before, during, and after this research project is complete with regards to the information gathered during the course of this study.

Name

Date

Jennifer Daniels, M.S.
Clinical Psychology Graduate Student
Primary Investigator

Date

Ethical Treatment of Data

As a member of Jennifer Daniels' research team, I understand that we will be collecting information on potentially sensitive experiences and behaviors, including sexual assault and other traumatic experiences as well as mental and physical health. In order to ensure that the confidentiality of every participant is protected, I agree to the following conditions:

- I will treat all information collected during the study as confidential. I will not discuss information about individual participants outside of the laboratory or with people who are not members of the research team.
- I will not discuss the results of the study outside of the laboratory until they have been made available through presentation at professional meeting or scientific publications or until the dissertation is complete.

I have discussed this form with Jennifer Daniels, M.S., and she has answered my questions. By signing this form, I agree to follow these conditions.

Printed Name of Research Assistant: _____

Signature of Research Assistant: _____

Date of Signature: _____

Printed Name of Investigator: Jennifer Daniels, M.S. _____

Signature of Investigator: _____

Date of Signature: _____

Writing as a Coping Mediator Between Trauma
and Psychological and Physical Health

Cover Sheet

Alabama Inmate Serial Number (AIS) _____

Code Number _____

Brief COPE

These items deal with ways you've been coping with stress in your life since you have been in prison. There are many ways to try to deal with problems. These items ask what you've been doing to cope with this one. Obviously, different people deal with things in different ways, but I'm interested in how you've tried to deal with it. Each item says something about a particular way of coping. I want to know to what extent you've been doing what the item says. How much or how frequently. Don't answer on the basis of whether it seems to be working or not-just whether or not you're doing it. Use these response choices. Try to rate each item separately in your mind from the others. Make your answers as true FOR YOU as you can.

- 1 = I haven't been doing this at all
- 2 = I've been doing this a little bit
- 3 = I've been doing this a medium amount
- 4 = I've been doing this a lot

- _____ 1. I've been turning to work or other activities to take my mind off things.
- _____ 2. I've been concentrating my efforts on doing something about the situation I'm in.
- _____ 3. I've been saying to myself "this isn't real."
- _____ 4. I've been using alcohol or other drugs to make myself feel better.
- _____ 5. I've been getting emotional support from others.
- _____ 6. I've been giving up trying to deal with it.
- _____ 7. I've been taking action to try to make the situation better.
- _____ 8. I've been refusing to believe that it has happened.
- _____ 9. I've been saying things to let my unpleasant feelings escape.
- _____ 10. I've been getting help and advice from other people.
- _____ 11. I've been using alcohol or other drugs to help me get through it.
- _____ 12. I've been trying to see it in a different light, to make it seem more positive.
- _____ 13. I've been criticizing myself.
- _____ 14. I've been trying to come up with a strategy about what to do.
- _____ 15. I've been getting comfort and understanding from someone.
- _____ 16. I've been giving up the attempt to cope.
- _____ 17. I've been looking for something good in what is happening.
- _____ 18. I've been making jokes about it.
- _____ 19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, or sleeping.
- _____ 20. I've been accepting the reality of the fact that it has happened.
- _____ 21. I've been expressing my negative feelings.
- _____ 22. I've been trying to find comfort in my religion or spiritual beliefs.
- _____ 23. I've been trying to get advice or help from other people about what to do.
- _____ 24. I've been learning to live with it.

- _____ 25. I've been thinking hard about what steps to take.
- _____ 26. I've been blaming myself for things that happened.
- _____ 27. I've been praying or meditating.
- _____ 28. I've been making fun of the situation.

Muenzenmaier's Scale – Self-Report
Histories of Physical and Sexual Abuse Questionnaire

Physical

Before you were 18-years-old:

1. Did anyone you lived with ever hit you or hurt you physically so that you had black and blue marks on your body, or some bleeding, or swelling in the area you were hit?
_____ yes _____no _____don't know
2. Did you feel pain that lasted for several hours because of being hit by someone you lived with?
_____ yes _____no _____don't know
3. Did you feel embarrassed of being hit in front of your brothers or sisters or anybody else?
_____ yes _____no _____don't know
4. Did you not go to school as a result of the beatings?
_____ yes _____no _____don't know
5. Did you need to see a nurse or a doctor as a result of the beatings?
_____ yes _____no _____don't know

Use the following scale to answer the next set of questions:

0=Never 1=Rarely(once or twice) 2=Sometimes (3-12 times)
3=Often (more than 13)

Before age 18, did anyone you lived with ever:

- _____ 1. hit you or beat you with their hand?
- _____ 2. hit you with something besides their hand?
- _____ 3. throw something at you?
- _____ 4. threaten you with a gun, knife, or other weapon?
- _____ 5. kick you?
- _____ 6. tie you up?
- _____ 7. lock you in a small place?
- _____ 8. burn you?
- _____ 9. stab or shoot you?
- _____ 10. do anything else to hurt you physically?

Sexual

Before you were 18-years-old:

1. Did anyone from your family ever play with you sexually or touch you in a way that made you feel uncomfortable?
_____ yes _____no _____don't know
2. Did anyone force you sexually?
_____ yes _____no _____don't know

3. Was there anything that used to go on in your family that made you feel bad about yourself, or made you feel guilty, or feel too bad to talk about?
 yes no don't know
4. Did anybody else, who was not part of your family, such as a friend of your parents, a teacher, or a neighbor ever touch you in a way that made you feel uncomfortable?
 yes no don't know
5. Did anyone force you sexually?
 yes no don't know
6. Did anything happen that you have been trying hard to forget?
 yes no don't know
7. Was there any time that you can think of that you were embarrassed about your body or any bodily function?
 yes no don't know

Use the following scale to answer the next set of questions:

0=Never 1=Rarely(once or twice) 2=Sometimes (3-12 times)

3=Often (more than 13)

Before age 18, did anyone ever:

1. touch you in a sexual way with their hands, or did they have you touch them?
 family member non-family member
2. force you to have oral contact? (e.g., "did they touch your vagina with their mouth?" Or "did they make you touch their penis/vagina with your mouth"
 family member non-family member
3. force you to have genital or anal contact (e.g., "did he put his penis in your vagina or rectum?"
 family member non-family member

White Bear Suppression Inventory

This survey is about thoughts. There are no right or wrong answers, so please respond honestly to each of the items below. Be sure to answer every item by circling the appropriate number beside each.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral or Don't Know	Agree	Strongly Agree

- 1 2 3 4 5 1. There are things I prefer not to think about.
- 1 2 3 4 5 2. Sometimes I wonder why I have the thoughts I do.
- 1 2 3 4 5 3. I have thoughts that I cannot stop.
- 1 2 3 4 5 4. There are images that come to mind that I cannot erase.
- 1 2 3 4 5 5. My thoughts frequently return to one idea.
- 1 2 3 4 5 6. I wish I could stop thinking of certain things.
- 1 2 3 4 5 7. Sometimes my mind races so fast I wish I could stop it.
- 1 2 3 4 5 8. I always try to put problems out of mind.
- 1 2 3 4 5 9. There are thoughts that keep jumping into my head.
- 1 2 3 4 5 10. There are things that I try not to think about.
- 1 2 3 4 5 11. Sometimes I really wish I could stop thinking.
- 1 2 3 4 5 12. I often do things to distract myself from my thoughts.
- 1 2 3 4 5 13. I have thoughts that I try to avoid.
- 1 2 3 4 5 14. There are many thoughts that I have that I don't tell anyone.
- 1 2 3 4 5 15. Sometimes I stay busy just to keep thoughts from intruding on my mind.