Testing the effects of expressive writing on PTSD symptom reduction: examining the role of event centrality

Derrecka Myschele Boykin

Follow this and additional works at: https://huskiecommons.lib.niu.edu/allgraduate-thesesdissertations

Recommended Citation

This Dissertation/Thesis is brought to you for free and open access by the Graduate Research & Artistry at Huskie Commons. It has been accepted for inclusion in Graduate Research Theses & Dissertations by an authorized administrator of Huskie Commons. For more information, please contact jschumacher@niu.edu.
Many existing treatments for posttraumatic stress disorder (PTSD) have clients focus on a worst identified traumatic experience, which can be challenging for individuals with repeated trauma exposure. It is assumed that, by focusing on the worst identified trauma, individuals will develop skills that improve their ability to cope with other, less emotionally provocative incidents. Yet to be determined, however, is whether an event’s personal significance affects treatment outcomes. The present study aimed to evaluate how individual differences in event centrality (i.e., the extent to which an event impacts one’s identity) influenced the effectiveness of a three-session expressive writing (EW) intervention for posttraumatic stress symptoms (PTSS). EW has been shown to reduce PTSS severity, and negative trauma-related appraisals are believed to mediate this relationship. Due to high attrition at the 3-week follow-up assessment (71.6%), main study hypotheses were examined in a modified intent-to-treat sample (N = 159) using data from baseline to post-treatment. Contrary to expectation, no within- or between-group differences in negative appraisals across sessions were observed. Changes in negative appraisals did not mediate the relationship between written disclosure condition (EW vs. control) and changes in PTSS severity, although negative appraisals were significantly related to PTSS severity. Sensitivity analyses with study completers yielded similar findings. Event centrality did not moderate those direct or indirect effects. A supplementary analysis using
follow-up data from study completers ($N = 38$) revealed no within- or between-group differences in negative appraisals or PTSS severity across time. Post hoc survival analyses showed similar rates of attrition across conditions and attrition was not predicted by demographic characteristics or reactions to study participation. Implications and study limitations are discussed.
TESTING THE EFFECTS OF EXPRESSIVE WRITING ON PTSD SYMPTOM REDUCTION: EXAMINING THE ROLE OF EVENT CENTRALITY

BY

DERRECKA MYSCHELE BOYKIN
©2017 Derrecka Myschele Boykin

A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

Dissertation Director:
Holly K. Orcutt
ACKNOWLEDGEMENTS

I want to express sincere gratitude to those who contributed their time, expertise, and support throughout this project. I would like to thank my primary advisor, Dr. Holly Orcutt, for her guidance and patience through the conceptualization and development of my dissertation. A special thank you is also given to my thesis committee members, Drs. Michelle Lilly, Kevin Wu, Katja Weimer, Anne Britt, and Patricia Wallace, for their valuable contributions. I am very thankful to all the undergraduate research assistants (Holly Gustafson, Alexandra Thelan, Alexandra Tavlas, Magally Zavala, Rachel Lindsay, Jacinta Anyanwu, and Krystle Calvin) without whom this project would not have come to fruition. Finally, I appreciate all the participants for their invaluable contributions to this project.
DEDICATION

To my husband, Jeffrey, whose love and encouragement allowed me to achieve my dreams. To my wonderful son, Jeffrey III, for bringing continuous joy. And to all my family and friends for their endless support.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td>ix</td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Overview of Expressive Writing and Its Effectiveness</td>
<td>2</td>
</tr>
<tr>
<td>The Clinical Utility of Expressive Writing for PTSD</td>
<td>5</td>
</tr>
<tr>
<td>Emotional Processing Theory and Expressive Writing</td>
<td>6</td>
</tr>
<tr>
<td>Empirical Research on Expressive Writing and PTSD</td>
<td>10</td>
</tr>
<tr>
<td>The Relevance of Event Centrality: A Potential Moderator</td>
<td>20</td>
</tr>
<tr>
<td>2. PRESENT STUDY</td>
<td>28</td>
</tr>
<tr>
<td>Hypothesis 1</td>
<td>30</td>
</tr>
<tr>
<td>Hypothesis 1a</td>
<td>31</td>
</tr>
<tr>
<td>Hypothesis 1b</td>
<td>31</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>31</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>32</td>
</tr>
<tr>
<td>3. METHODS</td>
<td>34</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Participants</td>
<td>34</td>
</tr>
<tr>
<td>Sample Size Estimation</td>
<td>35</td>
</tr>
<tr>
<td>Measures</td>
<td>38</td>
</tr>
<tr>
<td>Potential Covariates</td>
<td>38</td>
</tr>
<tr>
<td>Trauma History</td>
<td>39</td>
</tr>
<tr>
<td>Centrality of Event Scale (CES)</td>
<td>40</td>
</tr>
<tr>
<td>PTSD Cognition Inventory (PTCI)</td>
<td>41</td>
</tr>
<tr>
<td>PTSD Checklist for DSM-5 (PCL-5)</td>
<td>42</td>
</tr>
<tr>
<td>Emotional Suppression</td>
<td>43</td>
</tr>
<tr>
<td>Reactions to Research Participation-Revised (RRPQ-R)</td>
<td>43</td>
</tr>
<tr>
<td>Procedure</td>
<td>44</td>
</tr>
<tr>
<td>Data Analytic Plan</td>
<td>47</td>
</tr>
<tr>
<td>4. RESULTS</td>
<td>53</td>
</tr>
<tr>
<td>Data Screening</td>
<td>53</td>
</tr>
<tr>
<td>Descriptive Statistics</td>
<td>57</td>
</tr>
<tr>
<td>Manipulation Check</td>
<td>60</td>
</tr>
<tr>
<td>Hypothesis 1: Within- and Between-Group Differences in PTCI Scores</td>
<td>60</td>
</tr>
<tr>
<td>Hypothesis 2: Simple Mediation Analysis</td>
<td>61</td>
</tr>
<tr>
<td>Hypothesis 3: Conditional Process Analysis</td>
<td>61</td>
</tr>
<tr>
<td>Supplementary Analyses</td>
<td>64</td>
</tr>
<tr>
<td>Post Hoc Analyses</td>
<td>65</td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>5. DISCUSSION</td>
<td>68</td>
</tr>
<tr>
<td>Potential Measurement Issues</td>
<td>70</td>
</tr>
<tr>
<td>Potential Theoretical Flaws</td>
<td>71</td>
</tr>
<tr>
<td>Potential Research Design Flaws</td>
<td>77</td>
</tr>
<tr>
<td>Limitations</td>
<td>82</td>
</tr>
<tr>
<td>Implications and Future Directions</td>
<td>83</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>89</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>105</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Means, Standard Deviations, Ranges, and Bivariate Correlations Among Study Variables</td>
<td>55</td>
</tr>
<tr>
<td>2. Means and Standard Deviations of Study Variables by Written Disclosure Condition</td>
<td>58</td>
</tr>
<tr>
<td>3. Lifetime Prevalence of Trauma Experiences</td>
<td>59</td>
</tr>
<tr>
<td>4. Conditional Process Analysis Predicting PTSS Severity (PCL-5) from Written Disclosure Condition and Negative Appraisals (PTCI)</td>
<td>63</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Graphical Illustration of Proposed Conditional Process Model</td>
<td>33</td>
</tr>
<tr>
<td>2.</td>
<td>Graphical Illustration of Participant Flow</td>
<td>34</td>
</tr>
<tr>
<td>3.</td>
<td>Results of Mediation Model Regressing Changes in Posttraumatic Stress Symptom (PTSS) Severity from Baseline to Post-treatment on Written Disclosure Condition (0 = expressive writing [EW], 1 = control) through Changes in Negative Trauma-Related Appraisals…</td>
<td>62</td>
</tr>
<tr>
<td>4.</td>
<td>Cumulative Probability of Attriting as a Function of Written Disclosure Condition</td>
<td>66</td>
</tr>
</tbody>
</table>
LIST OF APPENDICES

Appendix | Page
--- | ---
1. INFORMED CONSENT (LABORATORY SESSIONS) | 105
2. DEMOGRAPHIC QUESTIONNAIRE | 108
3. LIFE EVENTS CHECKLIST FOR DSM-5 (LEC-5) | 111
4. TRAUMATIC LIFE EVENTS QUESTIONNAIRE (TLEQ) | 113
5. CENTRALITY OF EVENT SCALE (CES) | 123
6. PTSD COGNITION INVENTORY (PTCI) | 125
7. PTSD CHECKLIST FOR DSM-5 (PCL-5) | 128
8. EMOTIONAL SUPPRESSION QUESTIONNAIRE | 130
9. REACTIONS TO RESEARCH PARTICIPATION QUESTIONNAIRE-REVISED (RRPQ-R) | 133
10. DEBRIEFING FORM (LABORATORY SESSIONS) | 136
11. INFORMED CONSENT (FOLLOW-UP ASSESSMENT) | 141
12. DEBRIEFING FORM (FOLLOW-UP ASSESSMENT) | 144
Although individual reactions following exposure to potentially traumatic events can vary, posttraumatic stress disorder (PTSD) is a common outcome that affects more than a quarter (29%) of victims (Santiago et al., 2013). This debilitating psychiatric condition is characterized by intrusive memories, avoidance, persistent negative mood and cognitions, and increased physiological arousal (American Psychiatric Association [APA], 2013). Most standard treatments for PTSD (e.g., Prolonged Exposure, Cognitive Processing Therapy) focus on a worst-identified (index) trauma with the expectation that any learned skills will more easily generalize to less severe traumatic events (Resick, Monson, & Chard, 2008). Such qualifying events are likely traumatic experiences that have become the lens through which individuals view themselves and the world (i.e., event centrality; Berntsen, Willert, & Rubin, 2003). Therefore, it might be assumed that selecting index traumas with high centrality would enhance the effectiveness of PTSD treatments. To test this assumption, the present study investigated the impact of event centrality on the effectiveness of a brief, three-session expressive writing (EW) intervention for posttraumatic stress symptoms (PTSS).

Several studies have shown that EW reduces PTSS severity across diverse trauma populations (Bernard, Jackson, & Jones, 2006; Bragdon & Lombardo, 2012; Meston, Lorenz, & Stephenson, 2013; Sayer et al., 2015; Schoutrop et al., 2002; Sloan, Lee, Litwick, Sawyer, &
Marx, 2013; Sloan & Marx, 2004a; Sloan, Marx, Bovin, Feinstein, & Gallagher, 2012).

Although the mechanisms underlying the benefits of EW are unknown, one possibility is that prolonged exposure to trauma stimuli facilitates emotional processing (e.g., changes in negative trauma-related appraisals), which leads to symptom improvement (Foa, 1997; Foa, Huppert, & Cahill, 2006; Foa, Steketee, & Rothbaum, 1989). Similar to standard PTSD treatments, EW involves repeated (albeit indirect) exposure to trauma memories while individuals focus on their associated feelings and thoughts. Toward this end, the present study specifically examined whether individual differences in event centrality moderated the direct and indirect effect of EW on PTSS severity (as mediated by negative appraisals). This paper begins with a review of the effectiveness of EW broadly and in relation to PTSS. Next, this paper describes the relevance of event centrality in addition to its implications for trauma-focused treatment. Finally, this paper concludes with an explanation of the results and a discussion of the implications of present findings.

Overview of Expressive Writing and Its Effectiveness

A growing body of literature has shown that EW has robust effects on physical and psychological functioning (for a review, see Frattaroli, 2006). EW typically involves writing one’s deepest thoughts and feelings regarding a traumatic or stressful situation for 15-20 minutes across several days (Baikie & Wilhelm, 2005; Pennebaker, 1997; Pennebaker & Beall, 1986). When compared to control conditions where individuals write about emotionally neutral topics (e.g., time management, describing an object or place), EW has been associated with greater
improvements in long-term physical health (e.g., liver function, immune system functioning, lung function, blood pressure), occupational and academic functioning (e.g., grade point averages, absenteeism from work, re-employment), and psychological health (e.g., depression, mood/affect, PTSD; Baikie & Wilhelm, 2005; Pennebaker, 1997). Several variations of the EW protocol have emerged (e.g., weekly sessions ranging from 2 minutes to 45 minutes) and appear to have similar effects (Frattaroli, 2006).

Smyth (1998) was the first to examine the effectiveness of EW on physical and mental health outcomes in relatively healthy adult and college student populations. Potential moderators included participant characteristics (e.g., college sample, gender, age), dose of intervention (e.g., length and number of sessions, timing between sessions), essay content characteristics (e.g., writing about most traumatic event, writing about most recent trauma), outcome type (e.g., health care visits, reported symptoms, psychological well-being), and publication type (e.g., published, unpublished theses, dissertations, manuscripts). Smyth reviewed 13 studies that met the following criteria: (1) experimentally manipulated written disclosure, (2) instructed EW participants to write about trauma while control groups wrote about neutral topics, (3) contained outcome measures related to mental and physical health or general functioning, and (4) had sufficient statistical information to compute an effect size. The overall mean weighted effect size was statistically significant (Cohen’s $d = .47, p < .001$) and EW significantly improved self-reported health (e.g., fewer health care visits, less reported illness; $d = .42, p < .001$), psychological well-being ($d = .66, p < .001$), physiological functioning ($d = .68, p < .001$), and general functioning ($d = .33, p < .001$). The effect sizes for psychological well-being and physiological functioning were not statistically different.
This latter finding has been less supported by other meta-analytic studies that have included psychiatric populations. For example, Frisina, Borod, and Lepore (2004) focused exclusively on the effects of EW in clinical populations (e.g., hospital patients, psychiatric patients). Nine studies using psychiatric or physically ill participants satisfied their inclusion criteria, which were: (1) use of EW task as developed by Pennebaker and Beall (1986), (2) inclusion of quantitative measures of health (i.e., mental, physical), (3) sufficient data to compute an effect size, and (4) use of true experimental design (vs. quasi-experimental design) with random assignment. The mean weighted effect size was small \( (d = .19) \), yet significant \( (p < .05) \). This effect size was considerably lower than Smyth’s (1998) finding and implies that the positive benefits associated with EW may be less robust in clinical samples. Frisina et al. carried out a planned comparison for the health outcome types (i.e., physical, psychological) even though the test for homogeneity was not significant, suggesting that any observed variance may be due to sampling error. Therefore, the finding that the mean weighted effect size for physical health outcomes \( (d = .21, p = .009) \) was significantly higher than the mean weighted effect size for psychological health outcomes \( (d = .07, p = .169) \) should be interpreted with caution.

In her extensive review of 146 EW studies, Frattaroli (2006) detailed a more accurate representation of the conditions under which EW works best for relatively healthy and clinical samples. Studies were included if they: (1) used a variation of the original written disclosure task (Pennebaker & Beall, 1986), (2) were randomized with the inclusion of a neutral control group, (3) contained sufficient information to compute an effect size, (4) measured outcome variables at least one day post-writing, (5) presented original data not published in a previous source, and (6) assigned treatment groups without any other confounding variables (e.g.,
treatment participants receiving concurrent treatment that had not been offered to control participants). Similar to Frisina et al. (2004), Frattaroli found a small weighted mean effect size ($d = .06$) for EW, albeit significant ($p < .001$). Frattaroli argued that her inclusion of a higher percentage of unpublished studies (48%) as compared to Smyth (23%) and Frisina et al. (0%) may have lowered the overall effect size. In contrast to Frisina et al. (2004), the mean weighted effect size for physical outcomes ($d = .05; p < .001$) and for psychological outcomes ($d = .03; p < .001$) were comparable and significant. Thus, EW appears to have clinical utility as a psychological intervention.

The Clinical Utility of Expressive Writing for PTSD

EW has direct relevance as a potential intervention for PTSD. Consistent with first-line PTSD treatments (e.g., Prolonged Exposure, Cognitive Processing Therapy, Eye Movement Desensitization and Reprocessing; Foa, Keane, Friedman, & Cohen, 2009), EW is an individually administered treatment that involves a degree of exposure to trauma memories. Traditional exposure-based PTSD treatments promote direct confrontation of trauma memories through the detailed re-telling of targeted incidents. Even though EW consists of describing one’s deepest feelings and thoughts about traumatic experiences, it is likely that details about the trauma are given as rationale for why individuals think or feel a certain way about an event. Therefore, EW evokes indirect exposure to trauma memories. The basis of exposure is derived from emotional processing theory (Foa & Kozak, 1986), which emphasizes the importance of emotionally processing trauma memories that have not been fully processed due to excessive
avoidance (Foa et al., 2006; Foa & Kozak, 1986). Foa and colleagues (Foa, 1997; Foa et al., 2006; Foa et al., 1989) further posit that excessive avoidance interferes with natural recovery and the processing of trauma memories, which contributes to chronic PTSD. Although there is no consensus on the mechanisms underlying the beneficial effects of EW, there is greater empirical support for emotional processing theory as a possible theoretical framework (Baikie & Wilhelm, 2005).

**Emotional Processing Theory and Expressive Writing**

According to emotional processing theory, repeated, prolonged exposure to feared stimuli is needed to access the content of pathological fear structures within the larger fear network so that their elements can be modified. Fear structures are cognitive structures that contain information about feared stimuli (e.g., spider), fear responses (e.g., increased heart rate), and interpretations (or meanings) of the stimuli (e.g., “Spiders are dangerous”) and response (e.g., “If my heart is racing, I must be scared”). Fear structures contain the information and meanings that are related to escaping perceived threats and lead to an adaptive fear response and escape/avoidance behavior when danger is present. By contrast, pathological fear structures include erroneous associations among the stimulus, response, and meaning elements that distort reality in such a way that relatively safe situations are perceived as threatening. This, in turn, results in excessive response elements (e.g., avoidance, increased physiological reactivity). An example of this would be a pedestrian experiencing fear and sprinting across a desolate road to reach safety. Avoidance and cognitive biases contribute to the resistant nature of pathological
fear structures and prevent corrective learning. Confrontation of the feared stimuli is believed to activate the fear network and, once activated, the erroneous associations among feared stimuli, responses, and meaning elements can be weakened and new adaptive associations can be acquired (i.e., emotional processing; Foa et al., 2006; Foa & Kozak, 1986).

To facilitate emotional processing, Foa and Kozak (1986) proposed that prolonged confrontation with the feared stimuli results in decreases in short-term physiological arousal, which contradicts the feared stimuli-heightened arousal association. Additionally, exposure to the feared stimuli changes perceptions (or cognitive appraisals) of the probability that the feared outcomes will occur, as well as the valence of stimuli and responses. Short-term habituation disconfirms the assumption that physiological reactivity will remain constant in the presence of the feared stimuli until escape is realized. Long-term habituation (via repeated exposure) disconfirms inaccurate probabilities of potential threat. The valence of stimuli and responses can be challenged through either short- or long-term habituation. The newly acquired information competes with old information, such that any context could activate either the pathological fear associations or the newly acquired associations. This in turn determines behaviors, cognitions, and emotions, making it important (although sometimes unfeasible) to conduct exposures in multiple contexts to ensure that corrective learning is generalized.

Exposure therapy reduces PTSD via three proposed mechanisms (Foa, 1997). The first mechanism is emotional engagement with (and habituation to) the trauma memory. Emotional engagement is marked by increased physiological arousal that gradually dissipates as the feared image, object, or situation is confronted and the fear network is activated. The experience of habituation can change negative appraisals associated with PTSD, which is the second proposed
mechanism. Foa et al. (1989) believed that PTSD is distinct from other anxiety disorders in that it involves exposure to a traumatic event that violates basic concepts of safety. That is, stimuli and responses that once signaled safety become indicative of danger, rendering one’s world unpredictable and uncontrollable. Accordingly, Foa and colleagues (Foa, 1997; Foa et al., 2006; Foa et al., 1989) believe that individuals with PTSD develop two broad sets of negative cognitions about the world (“The world is dangerous”) and about themselves (“I’m incompetent”). The violation of safety leads to an overgeneralization effect where many stimuli become incorporated into the fear network. There is increasing evidence that negative appraisals are major contributors to the development and persistence of PTSD (Bryant & Guthrie, 2005, 2007; Clohessy & Ehlers, 1999; Dunmore, Clark, & Ehlers 1999, 2001; Ehlers, Maercker, & Boos, 2000; Fairbrother & Rachman, 2006; Halligan, Michael, Clark, & Ehlers, 2003; Lancaster, Rodriguez, & Weston, 2011; Laposa & Alden, 2003; O’Donnell, Elliott, Wolfgang, & Creamer, 2007). As such, negative appraisals are targeted through repeated exposure to feared stimuli with the assumption that the experience of habituation will provide corrective feedback that modifies erroneous beliefs. For example, gradual habituation to feared stimuli disconfirms beliefs that anxiety is eternal and that symptoms are a sign of incompetence. Repeated exposure and habituation also promote a distinction between the trauma and other, safe events. Consequently, individuals may adopt the perspective that the traumatic incident was a unique experience that does not have global implications. The third possible mechanism by which exposure reduces PTSS severity is that repeated exposure may encourage the organization of trauma memory, which is often fragmented and poorly integrated into autobiographical memory (e.g., Ehlers & Clark, 2000). Foa et al. (2006) argue that the development of a coherent trauma
narrative promotes structural changes in the pathological fear structures. Alternatively, they acknowledge that narrative cohesion could be a consequence of emotional processing. Additional research is needed to delineate this relationship.

It seems plausible that EW operates under similar theoretical principles as exposure therapy, with one caveat (Baikie & Wilhelm, 2005). As stated above, EW does not involve providing a detailed account of traumatic experiences as would be required in exposure therapy. However, individuals may justify their trauma-related thoughts and feelings by incorporating details of the trauma. In addition, exposure to the associated thoughts and feelings may serve as internal reminders of the trauma. Therefore, EW may involve, to a lesser degree, exposure to the trauma memory, thus, activating the fear network. Similar to exposure therapy, writing for a prolonged period of time (15-30 minutes) across multiple sessions should facilitate gradual habituation and lead to the disconfirmation of negative appraisals. Although, without explicit guidance from a therapist, it is possible that trauma survivors may not recognize and/or integrate corrective information that conflicts with the pathological elements of their fear structures. This underscores the importance of investigating the relationship between EW and negative appraisals within the context of PTSD. Thus far there has been no consistency in measuring cognitive change, including negative appraisals, following an EW task (Baikie & Wilhelm, 2005; Sloan & Marx, 2004b). The act of writing itself has been shown to promote the development of coherent trauma narratives after multiple repetitions (Kaufman & Sexton, 2006; Niederhoffer & Pennebaker, 2009). Thus, EW should evidence a meaningful change in PTSS severity.
Empirical Research on Expressive Writing and PTSD

Presently, findings regarding the clinical utility of EW for PTSD have been somewhat mixed. Earlier studies reported minimal improvement associated with written disclosure. In an initial study by Gidron, Peri, Connolly, and Shalev (1996), they investigated the effects of written disclosure on 14 Israeli PTSD patients. Participants were assigned to either an EW condition or a control condition. Across three days, disclosure participants wrote for 20 minutes about their most traumatic experiences while the control participants wrote about their daily routine. On the last day of writing, participants in both conditions were asked to orally elaborate on one of their writings. Results indicated that EW participants reported an increase in PTSD avoidance symptoms and decrease in medical visits at the 5-week follow-up assessment.

Although the symptom increase was unanticipated, there were several confounding variables that likely obscured their findings. First, sessions were held at participants’ homes, reducing internal validity (but increasing ecological validity). Second, as Smyth, Hockymeyer, and Tulloch (2008) noted, the combination of intervention strategies (i.e., writing plus oral elaboration) likely obscured the effects specific to EW. Third, Sloan and Marx (2004b) further noted that there were significant group differences on baseline measures (e.g., PTSS severity) in addition to participants taking psychiatric medications at the time of data collection.

Brown and Heimberg (2001) conducted an EW study with female rape survivors with varying degrees of PTSS severity ($N = 85$) in which they manipulated the disclosure environment. Participants were randomly assigned to either write about the facts of the rape (i.e., cognitive processing condition) or to write about the facts and their feelings about the rape
(i.e., cognitive plus affective processing condition). Afterward, participants either read their essays aloud to themselves (i.e., solitary disclosure condition) or disclosed them to a female confederate matched in age and race (i.e., interpersonal disclosure condition). Results indicated that there were no significant improvements in PTSS severity or secondary symptoms (i.e., social anxiety, depression) in any of the conditions immediately after or one month post-writing. (No effect sizes were given.) These null findings may suggest that disclosing about a severe trauma has minimal therapeutic benefits, which cannot be firmly disputed in the absence of a true control condition (e.g., trivial writing condition). The authors contended that their negligible findings may reflect a greater tendency among participants in the cognitive plus affective processing condition to conceal more personal information than participants in the cognitive processing condition. It is possible that the emotional depth of the cognitive plus affective processing essays was influenced by the fact that participants knew they would be reading their narratives aloud either alone or to another person. Another possibility may be that pre-selecting the topic (i.e., rape) prevented participants from writing about their most distressing traumatic experiences. There are greater therapeutic gains associated with allowing participants to self-select the trauma about which they write (Frattaroli, 2006). These gains may be maximized when the traumatic event has redefined the way in which one lives, thinks, and behaves – a construct known as event centrality. (The relevance of this construct to EW will be discussed in detail below.)

Smyth et al. (2008) investigated the acceptability in addition to the utility of EW among veterans and rape victims diagnosed with PTSD ($N = 25$). Participants were randomly assigned to a control group or EW group where they completed three individual writing sessions in a
single day. The sessions were conducted in 20-minute intervals followed by 15-minute breaks between each session. Smyth and colleagues modeled the EW group writing assignments after existing trauma-focused treatments to encourage the development of a coherent trauma narrative (e.g., Resick & Schnicke, 1992). First, EW participants focused on describing a traumatic incident and any associated thoughts, feelings, and sensations. Next, they were instructed to tell a story about how the event had impacted them. Finally, they examined the rationality of their negative beliefs before re-writing the story. They were asked to include any new insights and/or benefits that were attained across the three sessions. By comparison, the control group spent their time writing on time management (i.e., daily plans). Although no effect sizes were provided, the authors reported that the EW group demonstrated emotional habituation, as evidenced by increases in positive mood valence across sessions. No significant within- or between-group differences were observed for changes in PTSS severity from baseline to the three-month follow-up. Notably, there were improvements in mood state over time (e.g., dysphoria, tension, anger), suggesting that EW may have immediate and long-term benefits for alleviating negative mood. The authors concluded that psychiatric patients with PTSD may need adjunct therapy (e.g., skills training) to fully benefit from EW. Interestingly, Smyth et al. (2008) did not inquire about past or current treatment history, despite recruiting participants from trauma care agencies. Thus, participants may have been receiving adjunctive care, weakening the above argument. Additionally, participants who had received (or were receiving) trauma-focused care may have already processed their traumatic experiences. Therefore, EW may be better suited for trauma victims who have not effectively processed their traumas and are experiencing elevated distress as a result. In the present study, EW participants were allowed to
select the trauma about which they wrote, increasing the possibility that they would select poorly processed memories.

Sloan, Marx, and Greenberg (2011) examined the efficacy of EW for elevated PTSS severity in a sample of 42 college students. Consistent with the traditional EW paradigm, the participants randomly assigned to the EW group wrote about their feelings and thoughts related to a self-identified traumatic event for 20 minutes for three consecutive days while those randomly assigned to the control condition wrote about time management. Results indicated that all participants, regardless of their group membership, reported decreases in PTSS severity from baseline to a one-month follow-up. Physiological responding and self-reported emotional responding to writing conditions were also assessed as measures of emotional engagement and habituation. As expected, EW participants demonstrated significantly higher heart rate activity during the first session compared to the control participants. Contrary to expectations, there were no significant reductions in heart rate activity between sessions for either the EW group or the control group. EW participants reported significantly higher levels of unpleasantness and arousal during the first writing session than the control participants. However, neither EW participants nor control participants reported a significant reduction in unpleasantness or arousal. The authors concluded from the latter findings that EW participants may not have had sufficient time to habituate to emotional stimuli. Yet, spacing of sessions has not been shown to influence the magnitude of study results (Frattaroli, 2006). Alternatively, Sloan and colleagues suggested that the omission of rationale for the EW intervention may have contributed to their lack of group differences. However, the EW paradigm has been effective for improving health
conditions in many non-treatment-seeking populations (e.g., college students, caregivers of sick loved ones, retirees, community members; Frattaroli, 2006).

There is an increasing number of studies that have demonstrated the usefulness of EW for diverse trauma populations. Schoutrop et al. (2002) assessed the effects of written disclosure on 48 trauma-exposed undergraduate students. The EW participants wrote about past negative events for 45 minutes across five sessions over two weeks with the option to switch topics at each session. Schoutrop et al. included a non-writing, wait-list control condition instead of the standard trivial writing control group. The first three sessions were conducted in a laboratory setting while the final two sessions were conducted as home visits. Immediately following the experiment, no between-group differences were found for intrusions or avoidant behavior, although both groups reported a decrease in these symptoms. EW participants reported a continued decline in intrusive and avoidance symptoms while the wait-list participants reported an increase in symptom severity at the 6-week follow-up. This difference was statistically significant, suggesting that EW may have long-term benefits for trauma survivors. It is difficult to discern whether the significant improvement was a result of writing about trauma as opposed to writing about a stressful life experience, which might include trauma. The prompt instructed participants to write about any past negative event (as opposed to any past traumatic event). Consequently, it is possible that EW participants wrote about other, non-traumatic experiences that can be perceived as negative (e.g., romantic break-up, failing a test or class) but do not necessarily qualify as a Criterion A traumatic event (APA, 2013). Moreover, writing about stressful life events also produces positive outcomes (Cameron, & Nicholls, 1998; Esterling,
Antoni, Flectcher, Margulies, & Schneiderman, 1994; Lumley, & Provenzano, 2003; Pennebaker, Colder, & Sharp, 1990; Spera, Buhrfeind, & Pennebaker, 1994).

In one sample of 49 trauma-exposed college women with moderate levels of PTSS severity, Sloan and Marx (2004a) utilized a traditional EW research design with a trivial writing control group. EW participants were permitted to write about different traumatic experiences across sessions. Participants wrote in a private room for 20 minutes over three consecutive days. Results indicated a significant interaction effect, such that disclosure participants reported a significantly greater reduction in PTSS severity at the 4-week follow-up compared to control participants. A similar interaction pattern was observed for depressive symptoms and number of reported sick days. Emotional reactivity during writing sessions was measured to assess emotional responding and habituation. Analyses showed that EW participants demonstrated significantly greater salivary cortisol reactivity (a measure of reactivity to stress) than control participants in the initial writing session only. In contrast to Sloan et al. (2011), EW participants reported a significant reduction in levels of unpleasantness and arousal from the first session to the last session. This, however, was not true for control participants. These findings suggest that EW participants initially experience elevated arousal and negative emotions in response to the EW procedure that gradually dissipates over time. This supports that EW involves gradual habituation to feared stimuli – one necessary condition for effective emotional processing (Foa, 1997; Foa & Kozak, 1986).

Bernard and colleagues (2006) showed that patients recovering from a psychotic episode (N = 22) benefited from disclosing their thoughts and feelings about their illness. Participants in the written disclosure condition were instructed to write about the most stressful and upsetting
aspects of their illness whereas, the control group wrote about trivial topics for three sessions over 10 days. The EW group reported fewer illness-related PTSD symptoms than the control group four to six weeks after the final writing session. Similarly, 45 substance use disorder (SUD) inpatients with PTSD reported significant reductions in PTSS severity three months after the EW intervention (Bragdon & Lombardo, 2012). (It is worth noting that four sessions of the EW intervention were administered in conjunction with SUD treatment.) When Bragdon and Lombardo (2012) compared their findings with another sample of SUD inpatients with PTSD who received only SUD treatment (Coffey, Schumacher, Brady, & Cotton, 2007), the EW intervention appeared to evidence greater PTSS severity reduction.

In a randomized clinical trial, Meston et al. (2013) examined the effectiveness of EW for improving PTSS severity and sexual dysfunction in a sample of female childhood sexual abuse (CSA) survivors ($N = 91$). Participants had to be at least 18 years old, sexually active or cohabiting in a potential sexual relationship, and have experienced an involuntary sexual act before the age of 16. Exclusion criteria included: (1) experienced a trauma three months prior to enrollment, (2) sexually abused in the past two years, (3) diagnosed with a psychotic disorder in the previous six months, (4) actively suicidal or homicidal, (5) enrolled in ongoing therapy for sexual or abuse-related concerns (although participants were permitted to continue taking existing medications on which they had been stabilized), (6) using illicit drugs, or (7) in a currently abusive relationship. Participants were randomly assigned to either a sexual schema-focused condition or EW condition. Across five sessions, participants met with a master’s-level female therapist who conducted pre- and post-session risk assessments. The risk assessments involved discussing risk of harm to self or others, trauma-related distress, and use of coping
skills between sessions. Safety plans were created as needed and participants could spend an hour with the therapist after each writing session discussing the experience. After the pre-session risk assessments, therapists read writing instructions to participants before leaving participants alone to type for 30 minutes. The focus shifted across the five writing sessions for each condition. The sexual schema-focused group first wrote about the impact of their abuse on their beliefs about themselves and sexual functioning (session 1), followed by listing evidence for and against their sex-related beliefs (session 2), reviewing reasons for maintaining current sex-related beliefs and steps needed to change those beliefs (sessions 3 and 4), and discussing future goals for their sex lives while noting their progress and strengths (session 5). The EW group first focused on their thoughts and feelings about the abuse and its impact on their beliefs related to safety, trust, power and control, and self-esteem and intimacy (session 1), followed by reviewing maladaptive beliefs related to the abuse (sessions 2 – 4) and outlining future goals while consolidating information acquired over the course of treatment (session 5). Results indicated a reduction in PTSS severity, depression, and sexual dysfunction up to six months post-treatment in both writing groups. As noted above, this finding is not surprising given that writing about stressful life events (e.g., CSA, sexual dysfunction) is associated with physical and mental health benefits (e.g., Cameron, & Nicholls, 1998; Lumley, & Provenzano, 2003; Spera et al., 1994). Meston et al.’s use of a therapist-guided approach may have also obscured the effects unique to EW.

Other EW studies have included therapists to facilitate the intervention. Specifically, Sloan et al. (2012) developed an EW intervention (i.e., Written Exposure Therapy [WET]) fashioned after exposure therapy. The WET protocol is structured as five weekly sessions that
last 30 minutes to an hour with therapist contact kept minimal (10-25 minutes) at each session.

In the first session, psychoeducation about PTSD and treatment rationale for EW are provided. Afterward, clients are asked to independently write the details of a worst identified trauma for 30 minutes. The remaining 10-15 minutes of the session are reserved for processing the experience with the therapist. Subsequent sessions follow a similar structure with clients continuing to write about the same traumatic incident as well as their associated feelings and thoughts. In a preliminary study, Sloan et al. demonstrated the effectiveness of WET (compared to a wait-list condition) in reducing symptom severity in 46 motor vehicle accident survivors diagnosed with PTSD. Treatment effects were maintained up to six months. All participants in the WET condition exhibited a reliable improvement in their PTSS severity and none met diagnostic criteria for PTSD at the six-month assessment. Consistent with emotional processing theory, WET was associated with decreases in self-reported negative affect and arousal across sessions, implying that emotional habituation occurred. The authors contend that this finding confirms that their previous null findings regarding the effectiveness of EW for PTSD (Sloan et al., 2011) was due to an insufficient number of sessions to extinguish negative affect. Sloan and colleagues replicated these findings in a small sample of veterans diagnosed with PTSD (Sloan et al., 2013). At the three-month assessment, six (of seven) participants reported clinically significant improvements in PTSS severity while five of these participants no longer met diagnostic criteria for PTSD. Participants in both studies viewed the WET intervention as very credible and tolerable. Two notable limitations of the latter study (i.e., Sloan et al., 2013) are the small sample size and lack of control group. Additionally, all participants (apart from one) were receiving psychotropic medication. Despite these limitations, the WET intervention attempts to
standardize an otherwise unstandardized procedure. Implementing a specific protocol has the potential to advance research on EW by increasing the comparability of these studies, especially as it relates to PTSD treatment.

Recently, Sayer and colleagues (2015) explored the effectiveness of an online version of the EW paradigm in a sample of Afghanistan and Iraq War veterans ($N = 507$). This study differed from previous studies in that the EW condition focused on difficulties adjusting to civilian life for four sessions across 10 days. Thus, eligible participants were veterans reporting some degree of difficulty adjusting to post-military life. Participants randomly assigned to the EW condition were compared to participants in a factual writing condition (e.g., daily activities) and participants in a no writing condition on PTSS severity, distress, anger, physical complaints, reintegration difficulty, perceived social support, and life satisfaction. Sayer et al. found that EW was associated with greater reductions in physical complaints, anger, and distress as compared to factual writing; however, EW was not more effective than factual writing in reducing PTSS, reintegration difficulty, social support, or life satisfaction. Compared to no writing, EW evidenced greater reductions in all outcomes except life satisfaction. The authors note that the minimal differences between the EW and factual writing conditions may be due to selecting veteran-specific topics for the factual writing condition that evoked similar emotional reactions (and possibly similar cognitive processing) as the EW condition. This raises concerns with the validity of these findings.

Overall, there seems to be accumulating evidence in favor of the beneficial effects of EW for PTSD. EW produces similar effects ($d = .60-1.54$) on PTSS as PE (Hedge’s $g_s = .44-1.08$) and other exposure-based approaches (e.g., Bragdon & Lombardo, 2012; Powers, Halpern,
Ferenschak, Gillihan, & Foa, 2010; Schoutrop et al., 2002), illustrating its viability as a treatment for PTSD.

The Relevance of Event Centrality: A Potential Moderator

According to Frattaroli (2006), disclosure about events that have yet to be processed is associated with a larger effect size in EW studies. Toward this end, trauma survivors who write about poorly processed traumas should receive optimal benefits from EW because these events are likely to have significant personal meaning (i.e., high event centrality). Event centrality refers to the extent to which a traumatic event becomes the lens through which individuals understand themselves and their world (Berntsen & Rubin, 2006, 2007; Berntsen et al., 2003). Event centrality has been positively linked to PTSS severity (Barton, Boals, & Knowles, 2013; Bernard, Whittles, Kertz, & Burke, 2015; Berntsen & Rubin, 2006, 2007; Berntsen, Rubin, & Siegler, 2011; Boals, 2010; Boals & Schuettler, 2011; Brown, Antonius, Kramer, Root, & Hirst, 2010; Groleau, Calhoun, Cann, & Tedeschi, 2013; Lancaster et al., 2011; Robinaugh & McNally, 2011; Schuettler & Boals, 2011). Boals and Ruggero (2016) suggest that event centrality for negative events may serve as a risk factor for PTSD.

Berntsen et al. (2003) explain that memories with high event centrality are dysfunctionally integrated into autobiographical memory, which contributes to PTSS severity. Symptoms may be exacerbated when these dysfunctionally integrated trauma memories with high event centrality have been poorly processed due to excessive avoidance. Avoidance, as argued by Foa et al. (1989), maintains PTSD by preventing corrective learning experiences that
change the meaning of the traumatic events. Confrontation of such memories (via EW or exposure-based approaches) would presumably provide corrective learning experiences that would improve negative appraisals and result in symptom reduction (Foa et al., 2006; Foa & Kozak, 1986). By examining event centrality as a potential moderator, this study provides valuable information for the improvement of EW as an intervention for PTSD.

The concept of event centrality originated from research examining the quality and organization of trauma memories (Berntsen, 2001; Berntsen et al., 2003; Porter & Birt, 2001; Reviere & Bakeman, 2001; Rubin, Feldman, & Beckham, 2004). Many trauma theorists have held the perspective that trauma memories are fragmented, poorly elaborated into autobiographical memory, and processed in a manner that distinguishes them from other autobiographical memories (i.e., disintegration hypothesis; for a review of related theories, see Dalgleish, 2004). Berntsen et al. (2003) challenged this view, arguing that empirical support for the disintegration of trauma memory was largely based on clinical observations and was less supported when compared to studies on the phenomenology of autobiographical memories. For example, Ehlers and Clark (2000) propose in their cognitive model of PTSD that trauma memories are mostly comprised of sensory impressions that make individuals with PTSD feel as if they are “reliving” the trauma. Studies on autobiographical memory also document the role of sensory impressions in memory retrieval and the elicitation of a feeling of time travel to the original event (Johnson, 1988; Larsen, 1998). As a counter to the disintegration hypothesis, Berntsen et al. (2003) contend that trauma memories serve as landmarks in the organization of autobiographical memory (i.e., landmark hypothesis). The landmark hypothesis assumes that emotional arousal enhances (as opposed to impairs) memory (Buchanan & Lovallo, 2001; Cahill,
Gorski, & Le, 2003; Christianson, 1992). Toward this end, memories for highly emotional
events become distinct reference points from which less distinctive events are appraised and then
organized within the autobiographical memory network.

Berntsen et al. (2003) directly compared the disintegration view to the landmark view of
trauma memory in a sample of 113 trauma-exposed Danish undergraduate students with and
without PTSD. Participants completed two sets of questionnaires. The first set examined the
extent to which traumatic experiences were still affecting participants. The second set assessed
ability to recall the trauma memory, strategies used to cope with the memory, and coherence and
integration of trauma memory within the context of autobiographical memory. There were no
differences on demographic characteristics (e.g., age, gender) apart from prior treatment
experience. More participants with elevated PTSD (36% of 25) reported receiving trauma-
focused therapy as compared to participants without PTSD (17% of 84). The authors found that
participants with PTSD endorsed greater recall of trauma memory (e.g., various sensory details,
emotions at time of trauma) than participants without PTSD independent of prior therapy
experience. Berntsen et al. found further evidence in support of the landmark view. Participants
with PTSD drew more connections and similarities between their traumas and current life
experiences compared to participants without PTSD, which was facilitated by receiving prior
treatment. Participants with PTSD were also more likely to feel as though the trauma had
become a part of their identity than participants without PTSD, especially individuals who had
undergone treatment. The authors concluded that trauma memories were not just integrated (as
opposed to disintegrated) into autobiographical memory, but dysfunctionally integrated given the
clarity with which trauma memories were recalled and the role they played in shaping views of one’s past, future, and sense of self.

Based on this evidence, event centrality has been operationalized as trauma memories that are distinct, negative, highly emotional, and highly accessible personal memories that have become overly integrated into autobiographical memory (Berntsen & Rubin, 2006, 2007; Berntsen et al., 2003). Although the distinctiveness of trauma memories from other emotional memories is debatable (for a review, see Brewin, 2007), their occurrences are rare compared to the occurrences of positive and neutral life events (Diener & Diener, 1996). Research suggests that there is an overall bias toward remembering positive events (Walker, Skowronski, & Thompson, 2003). However, Berntsen and Rubin (2006) argue that trauma memories and memories of very stressful events are often better remembered than other autobiographical events due to the increased accessibility of memories for events that are rare, surprising, and intensely emotional, all of which describe the nature of trauma. Consequently, these memories may become a reference point for interpreting subsequent events as negative experiences that might otherwise be neutral or positive.

Traumas can also serve as “turning points” that are related to the reconceptualization of personal identity. Turning points are described as events or a series of events that alter or redirect the flow of the life course (Berntsen & Rubin, 2006). Turning points are mostly biased toward positive culturally expected life transitions, such as graduations, first jobs, and the birth of a first child (Berntsen & Rubin, 2004, 2006). By contrast, circumscribed traumatic events are usually unexpected, highly negative, and often contradict cultural norms, making them salient memories in one’s life narrative. Traumatic experiences also violate basic beliefs held about the
self (“I am worthy”) and the world (“The world is just”; Janoff-Bulman, 1989). This may cause trauma victims to redefine their understanding of themselves and the world based on the ideal that the traumatic event is the causal agent underlying subsequent behaviors, thoughts, and values.

From the event centrality framework, PTSD develops in response to the increased availability and saliency of memories related to traumatic events perceived as life-altering turning points. Traumatic memories may remain highly accessible for years because these events often violate personal beliefs and cultural norms. Accessibility is also influenced by the degree to which individuals engage in maladaptive coping strategies (e.g., avoidance, rumination). For example, whenever individuals try to “suppress” (or not think about) trauma-related thoughts and feelings, these thoughts and feelings tend to increase in frequency (i.e., “rebound effect”; Beck, Gudmundsdottir, Palyo, Miller, & Grant, 2006; Davies & Clark, 1998; Shipherd & Beck, 1999, 2005; Steil & Ehlers, 2000). Similarly, rumination (or repeated and passive focusing on distress and its possible outcomes; Nolen-Hoeksema, 1991; Nolen-Hoeksema, Wisco, & Lyubomirksy, 2008) rehearses the trauma memory, thereby increasing its accessibility. Events that are easily retrieved from memory are judged to have a higher frequency and higher probability of occurring (Tversky & Kahneman, 1973). Thus, trauma victims may be more likely to overestimate the likelihood of being victimized again (Berntsen & Rubin, 2006, 2007). This may lead to a persistent sense of threat, which is regarded as a fundamental characteristic of PTSD by Ehlers and Clark (2000). Additionally, memories that are highly accessible may easily enter consciousness in the form of intrusions upon exposure to internal and external stimuli. Strong affective reactions can accompany these trauma memories.
and elicit increased physiological arousal and avoidant behaviors. Emotional processing theory states that PTSS are maintained by avoidance, which prevents individuals from adequately processing trauma memories (Foa, 1997; Foa et al., 1989, 2006). Accordingly, poorly processed memories with high event centrality may be associated with increased PTSS severity. Furthermore, expressively writing about these types of memories may be especially beneficial for reducing avoidance, promoting trauma memory coherence, and disconfirming negative appraisals (Foa et al., 2006; Foa, Molnar, & Cashman, 1995; van Minnen, Wessel, Dijkstra, & Roelofs, 2002).

Evidence supports that trauma memories with high event centrality are associated with increasingly negative appraisals (Barton et al., 2013; da Silva et al., 2016; Lancaster et al., 2011). Thus, as new corrective information is learned, the structure of these meaning elements likely change within the fear network. For example, trauma victims may learn that they can manage their anxiety, that remembering the trauma is not dangerous, and that the trauma was a unique occurrence that does not necessarily generalize to other, relatively safe situations. As trauma-related appraisals become less negative, it may be assumed that event centrality will decrease (Barton et al., 2013; Lancaster et al., 2011). Although a possibility, there is research to suggest that a trauma memory can retain high event centrality despite the valence of trauma-related memories. Several studies have shown that high event centrality is associated with both PTSD and posttraumatic growth (Barton et al., 2013; Boals & Schuettler, 2011; Boals, Steward, & Schuettler, 2010; Groleau et al., 2013; Schuettler & Boals, 2011). Posttraumatic growth refers to a greater appreciation and renewed understanding of life, improved interpersonal functioning, and greater sense of personal strength and spiritual growth (Tedeschi & Calhoun, 1996). It is
highly correlated with PTSD ($r_s = .40-.57$; Barton et al., 2013; Boals & Schuettler, 2011; Boals et al., 2010), yet their relationship is not well understood. It is possible that, as individuals begin to view highly negative, life-altering traumatic experiences as the impetus for perceived change and growth following trauma exposure, the high event centrality of the trauma memories may remain intact.
The primary goal of the present study was to examine the impact of event centrality on treatment outcomes following a brief, three-session EW intervention for PTSS. There is accumulating support for EW as a viable treatment for PTSD (Bernard et al., 2006; Bragdon & Lombardo, 2012; Meston et al., 2013; Sayer et al., 2015; Schoutrop et al., 2002; Sloan et al., 2012; Sloan & Marx, 2004a; Sloan et al., 2013). As Frattaroli (2006) pointed out, further examination of potential moderators (e.g., event centrality) will increase knowledge about the optimal conditions under which EW is most effective. EW, similar to other trauma-focused treatments, consists of selecting a worst identified index trauma and the extent to which the disclosed trauma that has personal significance to the writer may influence his or her response to the intervention. Traumatic events with high event centrality should be associated with increased PTSS severity (Barton et al., 2013; Berntsen & Rubin, 2006, 2007; Berntsen et al., 2011; Boals, 2010; Boals & Schuettler, 2011; Brown et al., 2010; Groleau et al., 2013; Lancaster et al., 2011; Robinaugh & McNally, 2011; Schuettler & Boals, 2011). These symptoms may be exacerbated when the trauma has not been fully processed. Gradual habituation to trauma memories with high event centrality (particularly those that are poorly processed) should facilitate emotional processing and lead to structural changes in one’s fear network, such as changes in negative appraisals (Foa, 1997; Foa et al., 2006; Foa et al., 1989). Exposure-based PTSD treatments (including EW) enable individuals to confront avoided trauma memories and learn corrective information that restores their sense of competency and control. Consequently, as negative
appraisals improve, PTSS severity should decline. These changes will likely be greater for individuals who disclose about events that are viewed as central to their personal identities.

The present study was designed according to the suggestions of Frattaroli (2006) to optimize results. She proposed that successful EW studies included participants with health problems or a history of trauma, compensation for participation, a sufficient dose of the EW intervention (e.g., at least three writing sessions), disclosure about events that had not been fully processed, directed questions or specific examples of what to write (e.g., “Common examples include writing about serious or fatal car accidents, physical or sexual assault, and so forth”), and relatively short follow-up periods (less than one month). Accordingly, participants who endorse a history of trauma exposure were invited to participate in this study. Participants were comprised of introductory psychology students with a self-reported history of trauma exposure. An undergraduate sample was chosen to ensure enough variability in variables of interest to assess the hypothesized relationships. In addition, many EW studies have utilized undergraduate samples. Toward this end, participants were not required to meet a minimal level of PTSS severity given that prevalence rates of PTSD are usually low in college samples (Elhai et al., 2012).

Eligible participants were randomly assigned to either the experimental EW condition or a control (neutral topic) condition. Participants randomized into the EW condition were asked to specifically write about a worst identified traumatic experience (i.e., index trauma). Research suggests that writing about traumatic events for which a sense of closure (regardless of time since trauma) has been achieved is not beneficial (Naufel & Beike, 2004). Frattaroli (2006) also proposes that writing about older traumatic events may be more likely to be processed and
assimilated into self-schemas, thus reducing the effectiveness of a written disclosure intervention. Memories of recent or undisclosed traumas are likely to be poorly processed (Frattaroli, 2006) and vary in the level of event centrality based on the perceptions of trauma survivors. Thus, recency of index trauma was assessed as a potential covariate. Akin to traditional EW studies, the control participants wrote about time management topics (e.g., weekly plans, career goals). Participants completed three 15-minute writing sessions across two weeks, even though there is no evidence to suggest that the length and spacing of sessions would be significant moderators (Frattaroli, 2006). A follow-up assessment was administered three weeks following the final writing session. Participants were compensated with course credit and up to four draws for three $25 awards.

Given the considerably low number of participants who completed the 3-week follow-up ($n = 54$ of 190), study hypotheses focused on data from baseline and post-treatment. Supplementary analyses were conducted using follow-up data to assess the potential long-term effects of EW on relevant study outcomes (i.e., appraisals, PTSD symptom severity).

Hypothesis 1

To the author’s knowledge, there are no published studies that have examined the relationship between EW and negative appraisals. Nevertheless, according to emotional processing theory (Foa, 1997; Foa et al., 2006; Foa et al., 1989), exposure to one’s trauma memories and the associated thoughts and feelings should elicit a positive change in negative appraisals. Toward this end, the following hypotheses were made:
Hypothesis 1a

It was hypothesized that EW participants would report a significant reduction in negative appraisals from baseline (i.e., first writing session) to post-treatment (i.e., third writing session). By contrast, control participants were not expected to report a change in negative appraisals from baseline to post-treatment.

Hypothesis 1b

It was hypothesized that EW participants would report a greater reduction in negative appraisals as compared to control participants from baseline to post-treatment.

Hypothesis 2

Emotional processing theory, as applied to PTSD, depicts trauma-related appraisals as an important mechanism of change (Foa et al., 2006). Thus, EW reduces PTSS severity by improving negative appraisals. Toward this end, it was expected that changes in negative appraisals from baseline to post-treatment would function as a partial mediator of the relationship between written disclosure group (i.e., EW, control) and changes in PTSS severity from baseline to post-treatment.
Hypothesis 3

The direct and indirect effects of the written disclosure conditions on changes in PTSS severity from baseline to post-treatment were expected to vary based on the degree to which index traumas differed in event centrality (see Figure 1). The strength of the conditional direct and indirect effects was hypothesized to increase as event centrality increases, especially among EW participants as compared to control participants. More specifically, EW participants disclosing about index events with higher event centrality would evidence a greater improvement in PTSS severity via improvements in negative appraisals at post-treatment as compared to EW participants disclosing about events with lower event centrality. No change was expected for control participants regardless of the event centrality level of their index trauma.
Figure 1: Graphical illustration of proposed conditional process model. $\Delta$ in Appraisals = change in trauma-related appraisals; $\Delta$ in PTSD = change in posttraumatic stress disorder severity.
CHAPTER 3
METHODS

Participants

A modified intent-to-treat sample of 190 participants who completed at least one writing session was utilized in the present study. Participants were recruited from a mass testing subject pool of introductory psychology students. Inclusion criteria were: (1) exposure to at least one potentially traumatic event, (2) at least 18 years old, and (3) fluent in English. Participants were not required to meet diagnostic criteria for PTSD to qualify for this study.

The final sample consisted of 159 participants. Thirty-one participants were removed for the following reasons: (1) administrative errors during laboratory sessions (e.g., completed incorrect survey, technical issues with survey; \(n = 6\)), (2) failing to identify an index trauma (\(n = 23\)), and (3) extreme outliers on age (\(n = 2\)). Participants were, on average, 19.53 (\(SD = 2.04\)) years old. Most participants were college freshmen (54.7%) or sophomores (27.7%). Regarding race, 65.4% self-identified as White, 18.2% as Black, 5.7% as Asian/Pacific Islander, and 10.7% as “other/multiracial.” Only a minority of participants self-identified as Hispanic or Latino/a (15.7%). Participant flow is detailed in Figure 2. Sixty-five percent of participants completed all three writing sessions, followed by 11.6% who completed only two writing sessions and 22.6% who only completed one writing session. Only 43.2% completed the follow-up survey.
Figure 2: Graphical illustration of participant flow. EW = expressive writing.
Sample Size Estimation

It was determined that at least 118 participants were needed for this study. This *a priori* sample size was estimated using a Monte Carlo simulation technique described by Múthen and Múthen (2002). Monte Carlo simulation is an empirical method for evaluating the sampling distribution of statistical techniques under various conditions (e.g., assumption violations). First, population parameter values (i.e., regression coefficients, variable means and standard deviations) for a model are specified. Next, data are generated through random repeated sampling. That is, random samples are repeatedly drawn from the population to approximate model parameter values for each sample drawn. The model parameter estimates and standard errors are then averaged across the samples to create a sampling distribution. This enables researchers to investigate the extent to which those values and their confidence intervals (i.e., coverage) are biased (Paxton, Curran, Bollen, Kirby, & Chen, 2001).

Múthen and Múthen (2002) outlined a four-step process for using the Monte Carlo technique to determine *a priori* sample size for simple to complex structural equation models in Mplus. The first two steps are consistent with the procedures for Monte Carlo studies: model type is determined (Step 1) and the population parameter values are specified (Step 2). Step 3 is optional but involves modeling “data quirks,” such as missing data and non-normal variable distributions. In Step 4, researchers decide on the desired alpha level (α), power level (β), number of samples to simulate (m), sizes of samples (n), and a starting value (i.e., random seed). Múthen and Múthen (2002) recommend an *m* of 10,000. Large *m* values generate more stable
results than small $m$ values, although a large $m$ may not be needed for simpler path models with no data quirks (Beaujean, 2014).

Regarding the present study, there was limited information to derive population values for all the parameters specified in the full conditional model depicted in Figure 1. Most of the available literature has assessed the individual effects of EW, event centrality, and trauma-related appraisals on PTSS severity (Berntsen & Rubin, 2006, 2007; Boals & Schuettler, 2011; Bragdon & Lombardo, 2012; Brown & Heimberg, 2001; Gidron et al., 1996; Groleau et al., 2013; Meston et al., 2013; Robinaugh & McNally, 2010, 2011; Schtroup et al., 2002; Schuettler & Boals, 2011; Sloan & Marx, 2004a; Sloan et al., 2011; Smyth et al., 2008). However, no published studies have examined the interrelationships among all these constructs. Furthermore, there are no published studies to the author’s knowledge that have evaluated event centrality as a moderator of EW in relation to negative appraisals or PTSS severity. Thus, the full conditional process model could not be estimated using the Monte Carlo technique, but the mediation portion of the model could be tested in that fashion.

Following Múthen and Múthen’s (2002) method, the present sample size was estimated for the model depicted in Figure 1 (without the moderator). Population values (i.e., variable means and standard deviations) were obtained from existing literature (Barton et al., 2013; Boals & Schuettler, 2011; Groleau et al., 2013; Robinaugh & McNally, 2011; Schuettler & Boals, 2011) and an unpublished dataset (Orcutt, 2015). However, there was insufficient information to generate the population parameter estimates (i.e., regression coefficients) for Step 2. Therefore, the population parameter estimates were computed for the mediation analysis in Mplus using Monte Carlo simulation with summary data (i.e., correlations, variable means and standard
deviations) collected from previous research. Whenever more than one study reported correlations, means, or standard deviations for similar variables, these values were averaged. The regression coefficients were estimated for a hypothetical sample of 60 observations from a covariance matrix derived from the summary data. Sixty observations were chosen based on the “rule of thumb” of 20 observations per parameter ($N:q$ rule; Jackson, 2003). The regression equations were as follows: PTSD symptom severity = 4.41 – .04 (EW) + .63 (Trauma-Related Appraisals) and Trauma-Related Appraisals = 2.00 – .04 (Event Centrality). These values were input into Step 2. Since missing data and data non-normally distributed can be estimated using techniques, such as multiple imputation and maximum likelihood estimation with robust errors (Kline, 2011), no data quirks were modeled. For Step 4, the following criteria were selected: $\alpha = .05$, $\beta = .80$, $m = 10,000$, $n \geq 60$, and random seed was 53,487 (as specified by Múthen & Múthen, 2002).

To determine the appropriate sample size, Múthen and Múthen (2002) propose criteria for evaluating the relative bias of parameters, standard errors, and coverage, that is, the degree to which model values differ from population values. The following criteria must be satisfied in addition to achieve sufficient power at the specified alpha level: coverage values between .91 and .98, relative parameter bias $\leq |.10|$, and relative standard error bias $\leq |.05|$. Based on the above information, results showed that a minimal sample of 38 is sufficient for the mediation model. To ensure that the full conditional process model will have adequate power, 80 participants were added, per the $N:q$ rule (Jackson, 2003).
Measures

Potential Covariates

Although the study was randomized, demographic characteristics (e.g., age, gender, race/ethnicity, education status) could have differed between groups, which would reduce the internal validity and generalizability of study results. Basic demographic characteristics were assessed at baseline, including age (in years), sex (*male, female*), race, ethnicity, and education level (*freshman, sophomore, junior, senior, graduate level, other*). (For details, see Appendix B.) Race and ethnicity were defined according to the National Institutes of Health (NIH) reporting policy for race (i.e., White, Black or African American, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander, or “Not Listed”) and ethnicity (i.e., Hispanic or Latino/a). Race and ethnicity were combined into a single dichotomous variable (Non-Hispanic White = 1 vs. Other = 0). Similar to age, education level was measured continuously. A single item measured present use of psychotherapy and/or psychotropic medications at baseline and follow-up (Yes = 1, No = 0), given that current treatment involvement could influence the severity of negative appraisals and PTSS severity (Sloan & Marx, 2004b). Finally, the recency of an index trauma might influence study outcomes; therefore, participants were asked to estimate the amount of time (in years) that has passed since the index event last happened (especially in the case of on-going trauma) on the Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000).
Trauma History

In this study, the Life Events Checklist (LEC-5; Weathers, Blake, et al., 2013) was used to determine eligibility for this study (see Appendix C). The LEC-5 is a measure of lifetime exposure to 16 potentially traumatic events known to result in PTSD symptoms or posttraumatic distress. It also includes an item for specifying any other, unlisted stressful experiences. For each item, participants indicated their level of exposure (happened to me, witnessed it, learned about it, part of my job, not sure, doesn’t apply) and were able to mark all response options that applied. Participants endorsing exposure to at least one of these experiences (except for “other”), regardless of exposure level, were invited to participate in this study.

Although limited information exists about the psychometric properties of the LEC-5, there were minimal revisions from the previous version of the LEC for DSM-IV (Gray, Litz, Hsu, & Lombardo, 2004). Therefore, few differences in psychometric properties are expected. The original LEC was developed in conjunction with the original PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993) and it has demonstrated good psychometric properties in samples of college students and veterans (Gray et al., 2004). It converges well with other measures of trauma exposure (mean kappas across items = .55). Additionally, it is correlated with and predictive of posttrauma sequelae, including PTSD ($r = -.33$ to -.48), depression ($r = -.32$), and anxiety ($r = -.27$).

The TLEQ (see Appendix D) was administered at baseline to obtain a more thorough assessment of lifetime exposure to trauma. The TLEQ measures exposure to 22 potentially

---

1 There were two minor changes: (1) the wording of item 15 was changed from “unexpected death of someone close to you” to “sudden accidental death,” and (2) the response option “part of my job” was added.
traumatic life events, including natural disasters, sexual and physical assault, and witnessing family violence. It should be noted that item 5 ("Have you experienced the sudden and unexpected death of a close friend or loved one?") was modified to be more consistent with DSM-5 Criterion A ("Have you experienced the sudden violent death of a close friend or loved one [e.g., homicide, suicide]?”). Participants indicated the frequency (never, once, twice, 3 times, 4 times, 5 times, more than 5 times) that each type of traumatic event occurred. The final question asked participants to identify which of the previously endorsed traumatic experiences was considered as the most distressing (i.e., index trauma). Participants were also asked to estimate when the event last occurred to determine the recency of the index trauma. They were then informed that they would be referencing this index trauma throughout the remainder of the study. The TLEQ has evidenced strong psychometric properties, including good test-retest agreement (r = .83 - .88) across two weeks and high convergent validity with similar measures of trauma exposure (r = .92; Kubany et al., 2000).

Centrality of Event Scale (CES)

The CES (Berntsen & Rubin, 2006) was administered at baseline as a measure of how influential the memory of a traumatic experience has become for personal identity development and attributional style. Specifically, the CES (see Appendix E) is a 20-item scale that measures three interdependent functions of trauma memory: (1) as a reference point for everyday experiences, (2) as a turning point in one’s life story, and (2) as a central component of personal identity. While referencing their index trauma, participants rated the degree to which a traumatic
experience fulfilled each of these functions on a 5-point Likert-like scale (1 \textit{totally disagree} to 5 \textit{totally agree}). Items were averaged to compute a mean CES score (possible range = 1 – 5). Items appear to converge onto a single factor solution (Berntsen & Rubin, 2006). The CES has demonstrated excellent internal consistency (\(\alpha\)’s above .89) in other studies (e.g., Barton et al., 2013; Berntsen & Rubin, 2006; Boals & Schuettler, 2011; Boals et al., 2010; Groleau et al., 2013; Schuettler & Boals, 2011) as well as the present study (\(\alpha = .96\)). Furthermore, the CES has acceptable convergent and discriminant validity, as evidenced by its high correlation with PTSS severity (\(r_s = .35 - .43\)) and lower correlations with symptoms of depression (\(r = .27 - .39\)) and anxiety (\(r = .11\); Berntsen & Rubin, 2007).

\textbf{PTSD Cognition Inventory (PTCI)}

Negative trauma-related appraisals were examined at baseline, post-treatment, and follow-up using the PTCI (Foa, Ehlers, Clark, Tolin, & Orsillo, 1999). The PTCI is a 36-item measure of negative and dysfunctional trauma-related cognitions (see Appendix F). Participants indicated the degree (1 \textit{totally disagree} to 7 \textit{totally agree}) to which they endorse negative appraisals about themselves, the world, and self-blame relative to their index trauma. A total PTCI score was calculated (possible range = 7 – 21) at baseline, post-treatment, and follow-up by summing the average scores of each subscale (i.e., Self, World, Self-Blame), with higher total scores indicating greater negative appraisals (Foa et al., 1999).

The PTCI has been validated in clinical, community, and college student samples (Foa et al., 1999). The PTCI total score has been shown as highly reliable (\(\alpha\)’s = .93 - .97) and stable
across time (one-week test-retest \( r = .74 \), three-week test-retest \( r = .85 \)). The PTCI has good convergent validity with the Personal Beliefs and Reactions Scale \( (rs = .72 - .74; \) Resick et al., 1991). The PTCI correlates highly with measures of PTSD \( (r = .79) \), even after controlling for depression (partial \( r = .44 \)) and anxiety (partial \( r = .64 \)). The PTCI demonstrated high internal consistency in the present study \( (\alpha s = .93 - .98) \).

**PTSD Checklist for DSM-5 (PCL-5)**

PTSD symptom severity was assessed at baseline, post-treatment, and follow-up using the PCL-5 (Weathers, Litz, et al., 2013). The PCL-5 (see Appendix G) is a 20-item measure of PTSD symptoms, according to DSM-5 diagnostic criteria (APA, 2013). At baseline, participants rated the degree to which they have been bothered by PTSD symptoms related to their index trauma in the past month (0 *not at all* to 4 *extremely*). For post-treatment and follow-up \( (M = 30.34 \text{ days}, SD = 24.10) \), participants rated the severity of their symptoms secondary to their index trauma since the last completed survey. Items were summed to compute a PCL-5 total severity score (possible range = 0 - 80) at baseline, post-treatment, and follow-up. Internal consistency for the total scores were adequate \( (\alpha s = .94 - .97) \).

The psychometric properties of the PCL-5 were recently tested in two independent undergraduate samples of trauma-exposed college students \( (\text{sample 1: } N = 278; \text{ sample 2: } N = 558; \text{ Blevins, Weathers, Davis, Witte, & Domino, 2015}) \). It showed strong internal consistency \( (\alpha = .94) \) and acceptable test-retest reliability over a 1-week period \( (r = .82) \). It has also demonstrated good convergent validity with other PTSD measures \( (rs = .74 - .85) \). It was
moderately related to depression ($r = .60$), and was less related to facets of the Personality Assessment Inventory, such as alcohol use ($r = .40$), antisocial personality features ($r = .39$), and mania ($r = .31$). This suggests adequate discriminant validity.

**Emotional Suppression**

The degree to which participants suppressed their negative emotions while writing was assessed at baseline immediately post-writing. This 19-item questionnaire (see Appendix H) was originally developed by Orcutt (2015) for a longitudinal study examining the adjustment of women exposed to a campus shooting. Participants rated the degree to which they experienced each of the statements on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Select items were reverse coded so that higher scores reflected greater emotional suppression (possible range = 19 - 95). There are no published studies regarding the psychometric properties of this measure, but it evidenced adequate internal consistency in this study ($\alpha = .79$).

**Reactions to Research Participation-Revised (RRPQ-R)**

At post-treatment, the RRPQ-R (Newman, Willard, Sinclair, & Kaloupek, 2001) assessed participants’ reactions to participating in this study. The RRPQ-R (Appendix I) consists of 23 items that divide into five categories of reactions (i.e., Participation Factor, Personal Benefit, Emotional Reactions, Perceived Drawbacks, Global Evaluation). The Participation Factor subscale reflects general attitudes about personal satisfaction (e.g., “I was glad to be asked to
participate”). The Personal Benefits subscale is defined by the degree to which one experienced personal gain or insight (e.g., “I gained something positive from participating”). The Emotional Reactions subscale refers to experiencing negative emotions (e.g., “The research raised emotional issues for me that I had not expected”). The Perceived Drawbacks subscale measures perceived negative consequences from participating (e.g., “I found the questions too personal”). Finally, the Global Evaluation subscale assesses faith in confidentiality, respect of researcher for the individual, and beliefs that research is beneficent (e.g., “I trust that my replies will be kept private”). Items were rated on a 5-point Likert scale (1 strongly disagree to 5 strongly agree). Eight items were reverse coded before adding items to compute total subscale scores (possible range = 4 – 20 for Participation Factor, Personal Benefits Factor, and Emotional Reactions Factor; possible range = 5 – 25 for remaining subscales). The RRPQ-R has shown good internal consistency (α’s above .72) across numerous samples (DePrince & Chu, 2008) as well as the present study (α = .78).

Procedure

The present study was conducted as a two-part study (i.e., experimental laboratory writing sessions, 3-week follow-up online survey). Eligible participants were invited via email to participate in three experimental writing sessions across two weeks (average completion time = 14.18 days, SD = 25.91 days). Sessions were run individually by trained undergraduate research assistants who were aware of participant group assignment (i.e., group A, group B), but
blinded to specific study conditions (i.e., EW, control) and study hypotheses. Participants were blind to their group assignment.

At the outset of the initial writing session, participants were informed of the study’s purpose, risks and benefits of participating, and their rights as voluntary participants (see Appendix A). Participants who gave their verbal informed consent completed a computerized battery of baseline self-report measures (as detailed above). Qualtrics software was used to create and administer the self-report questionnaires on the computer.

Afterward, participants were handed a writing packet with instructions for either the EW condition or the control condition. (Participants were randomized into groups using the random number generator function of Microsoft Excel prior to their first writing session to ensure that each participant had an equal likelihood of being assigned to either condition.) All participants were asked to read their writing prompt aloud to the research assistant and could ask questions before writing. Evidence suggests that writing about traumatic events in longhand evokes a stronger emotional response than typing about them (Brewin & Lennard, 1999). Therefore, participants handwrote their essays. EW participants wrote about their index trauma for 15 minutes using the following prompt (adapted from Pennebaker, 1997):

I would like for you to write about your very deepest thoughts and feelings about the traumatic event that you identified as the most distressing earlier in this session. In your writing, I’d like you to really let go and explore your very deepest emotions and thoughts. You might tie your topic to your relationships with others, including parents, lovers, friends, or relatives, to your past, your present, or your future, or to who you have been, who you would like to be, or who you are now. All of your writing will be kept completely confidential. Don’t worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.
At subsequent sessions, participants were asked to write for 15 minutes about the same index trauma using a similar prompt. They were encouraged to add, change, or elaborate on details that may have been excluded from the previous essays. Following the first two writing sessions, participants were partially debriefed and provided with information regarding local counseling resources. At the end of the final writing session, all participants were thoroughly debriefed and provided with a list of local counseling resources in case they experienced any unanticipated distress as a result of their participation in this study (see Appendix I).

Control participants also attended three writing sessions within the same time frame. They wrote for 15 minutes about time management topics using the following prompt (adapted from Baikie, Geerligs, & Wilhelm, 2012):

I would like you to write about how you use your time. In your writing, I’d like you to be as objective as possible, by concentrating on the facts and details of how you spend your time. I am not interested in your emotions or opinions, rather I want you to try to be completely objective. Feel free to be as detailed as possible. Your task is to describe what you will be doing today. For example, you might start with what you plan to do after the experiment. You could include things you plan to eat, where you plan to go, which buildings or objects you will pass by as you walk from place to place. The most important thing in your writing, however, is for you to describe what you did as accurately and as objectively as possible. Don’t worry about spelling, sentence structure, or grammar. The only rule is that once you begin writing, continue to do so until your time is up.

At the second and third writing sessions, control participants wrote for another 15 minutes using the same prompt, but with the task specified as describing their plans for the week and career goals.

Participants who consented to future contact were invited via email to complete the 3-week follow-up survey measuring primary variables of interest (i.e., trauma-related appraisals, PTSD symptom severity) regardless of completion status. This included participants who
completed at least one writing session. Similar to session 1, participants provided their informed consent (see Appendix K) before taking the online survey. Once the survey was complete, participants were directed to the final debriefing form (Appendix L). Participants received research credits as well as up to four draws for three $25 awards.

Data Analytic Plan

Potential between-group differences on demographic variables (e.g., age, race, gender, education) and sample characteristics (e.g., treatment history, baseline symptom severity) were assessed using a series of t tests. Additionally, a manipulation check was performed after screening data for accuracy to ensure that participants followed the writing prompts accordingly. This was accomplished by evaluating the level of emotionality in essays using the Linguistic Inquiry and Word Count (LIWC2015; Pennebaker, Booth, Boyd, & Francis, 2015) text analysis software program. The LIWC2015 computes the degree to which over 70 categories of words (e.g., self-references, causal words) are used in any text. Emotionality was measured by evaluating the average number of overall emotion words (i.e., positive, negative) across the sessions. The emotionality of EW essays was compared to the emotionality of the control essays using a t test. It was expected that the EW essays would contain significantly more emotion words than the control essays (Brown & Heimberg, 2001; Graybeal, Sexton, & Pennebaker, 2002; Rivkin, Gustafson, Weingarten, & Chin, 2006). All preliminary analyses were conducted in SPSS 21.0.
Main study hypotheses were conducted in Mplus 6.0. To test Hypothesis 1 (i.e., within-and between-group differences in PTCI scores across sessions), hierarchical linear modeling (HLM), also known as linear mixed modeling, multilevel mixed modeling, and random effects modeling, was used. HLM is an alternative approach to standard linear models (e.g., ordinary least-squares regression, ANOVA) that is appropriate for studies with clustered data, longitudinal data, or repeated-measures data. HLM assumes that the residuals of continuous outcome variables approximate a normal distribution, although they may not be independent of one another or have constant variance. Mixed modeling techniques, such as HLM, have several advantages over standard linear models, including utilizing all available data for maximal efficiency, allowing for time to vary between measurements, having the capacity to estimate the fixed effects of time-varying covariates in repeated-measures or longitudinal data sets, and allowing structured covariance matrices for the random effects and the residuals (West, Welch, & Galecki, 2007).

HLM utilizes an iterative approach to investigating multiple levels of relationships within individual-level dependent variables (Hofman, 1997; Woltman, Feldstain, MacKay, & Rocchi, 2012). The “level-1” analysis describes the relationship between independent and dependent variables at the individual (i.e., participant) level. The level-1 analysis provides information about within-group differences. Thus, the level-1 analysis assessed the effect of time (0 = baseline, 1 = post-treatment) on appraisals (Hypothesis 1a). The “level-2” analysis describes the relationship between level-1 relationships (i.e., intercept and slope parameters) and higher order variables (e.g., grouping variable). In this study, written exposure condition (0 = EW, 1 = control) was expected to predict the variation in level-1 slopes and intercepts (Hypothesis 1b).
Parameters were estimated using maximum likelihood estimation (MLE; West et al., 2007). Researchers have strongly recommended utilizing MLE (and similar techniques) when data are missing at random as opposed to imputation methods, such as last observation carried forward, which can result in seriously biased estimates (Altman, 2009; Dziura, Post, Zhao, Fu, & Peduzzi, 2013; National Research Council, 2010). Mplus utilizes full-information MLE (Múthen & Múthen, 1998-2012). Coefficients were considered significant at the .05 alpha level. A significant coefficient for written disclosure condition predicting level-1 slopes would support a cross-level interaction providing evidence of within- and between-group differences in PTCI scores across sessions. Potential covariates were included if they were significantly related to written disclosure condition and PTCI scores at baseline and post-treatment.

For Hypothesis 1 to be supported, several conditions had to be established (Hofman, 1997; Woltman et al., 2012). Condition 1 describes the existence of systematic within- and between-group variance in the outcome variable. Conditions 2 and 3 refer to significant variance in the level-1 intercepts and slopes, respectively. Finally, this variance in the intercepts and slopes should be significantly related to the level-2 grouping variable (i.e., conditions 4 and 5, respectively). These conditions are evaluated using a series of random regression models. First, a null model partitioning the variance in PTCI scores into its within- and between-group components is estimated. Condition 1 is satisfied if the level-2 (between-group) variance is significantly different from zero. The null model also allows for the calculation of the intra-class correlation (ICC), which indicates the percentage of the total variance that resides between groups (Woltman et al., 2012). Some argue that ICCs “sufficiently close” to zero imply that level-1 units are statistically independent and multilevel modeling is not warranted. Hayes
(2009) notes that determining what ICC value qualifies as “sufficiently close” depends on several factors and that values as small as 0.05 have been shown to invalidate hypotheses. Nezlek (2008) adds that multilevel modeling should be used whenever the data are represented at multiple levels regardless of the ICC value. Thus, the ICC was reported in this study to provide an estimation of how clustered data were.

Next, a random coefficient model tests whether there is significant variance in the level-1 intercepts and slopes across groups. Condition 2 is supported if the variance across groups in the intercepts is significantly different from zero. Similarly, condition 3 is supported if the variance across groups in the slopes is significantly different from zero. The level-1 residual variance of the random coefficient model can be compared to the within-group variance in the null model to compute the amount of level-1 variance accounted for by level-1 predictors using the equation specified by Hofman (1997). The last set of models is only tested if the second model indicates significant variance in the intercepts and/or slopes. If there is significant variance in the intercepts (i.e., condition 2 is met), then an intercepts-as-outcomes model tests whether this variance is significantly related to the level-2 predictor. If there is significant variance in the slopes (i.e., condition 3 is met), then a slopes-as-outcomes model tests whether this variance is significantly related to the level-2 predictor. This model and the intercepts-as-outcomes model are similar except the grouping variable is added as a predictor of the slopes equation in the level-2 analysis. A significant coefficient in either model indicates that the condition has been met. The slopes-as-outcomes model provides direct support for the cross-level interaction.

Centering options are available for HLM to make intercepts more interpretable when a value of
zero on the level-1 predictor is not meaningful. Accordingly, centering was not used in this study given that zero on time reflected baseline PTCI scores.

Hypothesis 2 was tested using simple mediation analyses. It was expected that the change in appraisals from baseline to post-treatment (Δ PTCI scores) would mediate the relationship between written disclosure groups and the change in PTSS severity from baseline to post-treatment (Δ PCL-5 scores). The change scores were computed by subtracting the post-treatment scores from the baseline scores, such that positive values reflect an improvement while negative values reflect a decline. The magnitude of the indirect effect was estimated using bootstrapping. Bootstrapping is not predicated on the assumption that the indirect effect is normally distributed and has more power than traditional methods for testing indirect effects (e.g., Sobel test; Hayes, 2009). Additionally, it yields bias-corrected confidence intervals (CIs) that are empirically-derived, which is an improvement on the percentile bootstrap CIs (Preacher & Hayes, 2008). Significance can be inferred if the confidence interval does not contain zero.

Conditional process analysis, as described by Hayes (2013), was conducted by adding event centrality as a moderator to the mediation model. As stated by Hypothesis 3, it was expected that the indirect effect of written disclosure on Δ PCL-5 scores (via Δ PTCI scores) would be conditioned on varying levels of event centrality. (Mplus syntax for the conditional process model was adapted from Stride, Gardner, Catley, & Thomas [2015].) An interaction term was created from the product of written disclosure condition and event centrality (mean-centered). Significant interaction terms imply significant conditional and/or conditional indirect effects. Any significant interaction effects can be further assessed using simple slopes analysis to probe these interactions at two levels (±1 SD) of event centrality (Hayes, 2013).
It has been suggested that sensitivity analyses should be performed to determine the robustness of primary findings (Altman, 2009; Thebane et al., 2013). Thus, the analyses for Hypotheses 1 and 2 were repeated using only participants with complete data at baseline and post-treatment ($n = 83$) instead of the intent-to-treat sample. It was assumed that, due to the small size of this completer sample, re-analyzing Hypothesis 3 would be considerably underpowered. Similarities between study results are discussed within their respective sections.

Finally, a supplementary analysis using follow-up data was conducted to determine whether there were any within- and between-group differences in appraisals and PTSS severity from baseline to follow-up using the same HLM procedure as described for Hypothesis 1. Only study completers with follow-up data were included in this analysis ($N = 38$).
CHAPTER 4
RESULTS

Data Screening

Data were first assessed for accuracy. The means, standard deviations, and ranges of each variable were within their expected range. To identify potential univariate outliers (i.e., values $\geq 3$ $SD$s from the variable mean), data values were converted to standardized scores (Kline, 2011; Osborne, 2013). Two extreme univariate outliers were detected on age and omitted from further analysis. To detect multivariate outliers, Mahalanobis distances were computed (Kline, 2011; Tabachnick & Fidell, 2007). No multivariate outliers were detected. Approximately 44.8% of the sample were missing data on the following variables: event centrality ($n = 2; 1.1\%$), baseline PTCI scores ($n = 7; 3.8\%$), post-treatment PTCI scores ($n = 63; 34.4\%$), baseline PCL-5 severity scores ($n = 25; 13.7\%$), and post-treatment PCL-5 severity scores ($n = 68, 37.2\%$). The pattern of missingness (e.g., missing at random, missing not at random) was assessed. A series of independent $t$ tests revealed no significant differences between participants with and without missing data on variables with more than 5% missing values. This suggests that data were missing at random (Tabachnick & Fidell, 2007).

Next, data were examined to determine whether relevant statistical assumptions underlying HLM and regression were satisfied. Lack of multicollinearity among predictor variables, highly influential values, and homoscedasticity are assumed in multilevel mixed
modeling approaches (West et al., 2007). Study variables did not appear to have high collinearity, as evidenced by high tolerance values (above .10) and low variance inflation factor values (below 10; Cohen, Cohen, Aiken, & West, 2003). Cook’s $D$ values represent the degree to which the omission of an estimate would result in a change in parameter estimates. In this study, values were below the recommended cutoff of 1.0 (Cohen et al., 2003). Covariance ratio values represent the degree to which the omission of an estimate would change the precision of parameter estimates. No variables appeared to be highly influential. The non-significant Box’s $M$ test ($p = .611$) indicates that the assumption of homoscedasticity was not violated.

Normality, homoscedasticity, linearity, and absence of measurement error are important assumptions of regression (Hair, Black, Babin, & Anderson, 2009; Osborne & Waters, 2002; Tabachnick & Fidell, 2007). Normality was first assessed graphically using frequency histograms by examining the shape and peakedness of the distributions of continuous variables (Cohen et al., 2003; Hair et al., 2009; Osborne, 2013; Tabachnick & Fidell, 2007). Expected normal probability plots were also examined and are arguably more helpful than frequency histograms (Tabachnick & Fidell, 2007). All study variables appeared to approximate normality, and a non-significant Box’s $M$ test ($p = .079$) indicates that the assumption of homoscedasticity was met. Non-linearity was not detected after visually inspecting a bivariate scatterplot for each independent variable with the dependent variable (Cohen et al., 2003; Hair et al., 2009).

Finally, zero-order bivariate correlations were computed to assess the relationship between study variables and potential covariates (shown in Table 1). Potential covariates included demographic characteristics (i.e., age, gender, race/ethnicity, education status), current
Table 1
Means, Standard Deviations, Ranges, and Bivariate Correlations Among Study Variables

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Race/ethnicity</td>
<td>- .14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gender</td>
<td>- .21**</td>
<td>&lt; .01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Education level</td>
<td>.72**</td>
<td>- .05</td>
<td>- .19*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Current treatment use</td>
<td>&lt; .01</td>
<td>- .13</td>
<td>- .24**</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Recency of trauma</td>
<td>- .06</td>
<td>- .11</td>
<td>.16*</td>
<td>- .10</td>
<td>- .05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Written disclosure condition</td>
<td>.10</td>
<td>.04</td>
<td>- .04</td>
<td>.07</td>
<td>- .01</td>
<td>.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Centrality of Event Scale</td>
<td>.06</td>
<td>.01</td>
<td>.25**</td>
<td>&lt; .01</td>
<td>.19*</td>
<td>.07</td>
<td>.17*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. PTCI (baseline)</td>
<td>- .01</td>
<td>- .21**</td>
<td>.25**</td>
<td>.01</td>
<td>.20*</td>
<td>- .03</td>
<td>.07</td>
<td>.37**</td>
<td></td>
</tr>
<tr>
<td>10. PTCI (post-treatment)</td>
<td>&lt; .01</td>
<td>- .06</td>
<td>.13</td>
<td>.03</td>
<td>.14</td>
<td>- .06</td>
<td>.06</td>
<td>.28**</td>
<td>.43**</td>
</tr>
<tr>
<td>11. PCL-5 (baseline)</td>
<td>.15</td>
<td>- .07</td>
<td>.18*</td>
<td>.08</td>
<td>.10</td>
<td>- .08</td>
<td>.18*</td>
<td>.45**</td>
<td>.43**</td>
</tr>
<tr>
<td>12. PCL-5 (post-treatment)</td>
<td>.10</td>
<td>- .03</td>
<td>.08</td>
<td>.10</td>
<td>.05</td>
<td>- .15</td>
<td>.10</td>
<td>.16</td>
<td>.29**</td>
</tr>
</tbody>
</table>

M   19.53  0.58  0.54  1.69  0.09  4.02  0.52  2.61  65.07
SD  2.04  0.50  0.50  0.95  0.28  3.91  0.50  1.02  25.19
Minimum  18  0  0  1  0  0  0  1.00  33
Maximum  28  1  1  7  1  19  1  4.75  149

(Continued on following page)
Table 1 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Race/ethnicity&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Gender&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Current treatment use&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Recency of trauma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Written disclosure condition&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Centrality of Event Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. PTCI (baseline)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. PTCI (post-treatment)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. PCL-5 (baseline)</td>
<td>.29&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12. PCL-5 (post-treatment)</td>
<td>.63&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.33&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-</td>
</tr>
</tbody>
</table>

|M| 72.11| 9.93| 9.71|
|SD| 33.80| 9.95| 9.82|
|Minimum| 33| 0| 0|
|Maximum| 168| 41| 36|

Note. *N* = 159. PTCI = PTSD Cognition Inventory. PCL-5 = PTSD Checklist for *DSM-5*.  
<sup>a</sup> Race/ethnicity coded as Minorities (= 0) and Non-Hispanic Whites (= 1).  
<sup>b</sup> Gender coded as males (= 0) and females (= 1).  
<sup>c</sup> Current treatment use coded as no (= 0) and yes (= 1).  
<sup>d</sup> Written disclosure condition coded as EW (= 0) and control (= 1).  
*<sup>p</sup> < .05. **<sup>p</sup> < .01.
treatment use (i.e., trauma-focused therapy, psychotropic medications), and recency of exposure. Covariates that were significantly related to predictor variables and the mediator and/or outcome variable would be included in subsequent analyses (Skelly, Dettori, & Brodt, 2012). Based on these criteria, no covariates were detected.

**Descriptive Statistics**

Table 2 shows the means and standard deviations of demographic variables and study variables by condition. Using independent t tests, there were significant differences in baseline levels of event centrality and PTSS severity. Control participants reported higher event centrality and greater PTSS severity at baseline than EW participants. No other group differences were observed.

On average, participants reported exposure to 3.42 (SD = 2.58; Median = 3) types of potentially traumatic events across their lifetimes (range = 1 – 13). Table 3 shows the percentage of participants who reported each type of event. Of these events, the most commonly endorsed index traumas were the sudden violent death of a loved one (18.2%); a loved one surviving a life-threatening accident, assault, or illness (13.2%); family violence (11.9%); and adult sexual assault (6.9%). The last occurrence of index events (i.e., event recency), on average, was about 4.03 (SD = 3.96) years ago. Approximately 2.5-5% of the sample scored above the clinical cutoff for a probable diagnosis of PTSD (i.e., PCL-5 total scores > 31; Blevins et al., 2015).
Table 2

Means and Standard Deviations of Study Variables by Written Disclosure Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW Condition</th>
<th></th>
<th></th>
<th>Control Condition</th>
<th></th>
<th></th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>%</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Age</td>
<td>77</td>
<td>19.32</td>
<td>1.65</td>
<td></td>
<td>82</td>
<td>19.72</td>
<td>2.34</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>77</td>
<td></td>
<td>82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>43</td>
<td>55.8</td>
<td>49</td>
<td>59.8</td>
<td></td>
<td>34</td>
<td>44.2</td>
<td>33</td>
</tr>
<tr>
<td>Majority</td>
<td>34</td>
<td>44.2</td>
<td>33</td>
<td>40.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>76</td>
<td></td>
<td>82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>33</td>
<td>43.4</td>
<td>39</td>
<td>47.6</td>
<td></td>
<td>43</td>
<td>56.6</td>
<td>43</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>56.6</td>
<td>39</td>
<td>47.6</td>
<td></td>
<td>34</td>
<td>44.2</td>
<td>33</td>
</tr>
<tr>
<td>Education level</td>
<td>77</td>
<td>1.62</td>
<td>0.76</td>
<td></td>
<td>82</td>
<td>1.76</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>Current Treatment Use</td>
<td>77</td>
<td></td>
<td>82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7</td>
<td>9.1</td>
<td>7</td>
<td>8.5</td>
<td></td>
<td>7</td>
<td>9.1</td>
<td>7</td>
</tr>
<tr>
<td>No</td>
<td>70</td>
<td>90.9</td>
<td>75</td>
<td>91.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrality of Event Scale</td>
<td>76</td>
<td>2.42</td>
<td>1.02</td>
<td></td>
<td>81</td>
<td>2.78</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>PTCI (baseline)</td>
<td>72</td>
<td>63.18</td>
<td>22.31</td>
<td></td>
<td>80</td>
<td>66.78</td>
<td>27.56</td>
<td></td>
</tr>
<tr>
<td>PTCI (post-treatment)</td>
<td>51</td>
<td>70.02</td>
<td>32.38</td>
<td></td>
<td>51</td>
<td>74.20</td>
<td>35.36</td>
<td></td>
</tr>
<tr>
<td>PTCI (follow-up)</td>
<td>20</td>
<td>81.70</td>
<td>42.26</td>
<td></td>
<td>17</td>
<td>67.35</td>
<td>31.67</td>
<td></td>
</tr>
<tr>
<td>PCL-5 (baseline)</td>
<td>66</td>
<td>8.17</td>
<td>8.24</td>
<td></td>
<td>68</td>
<td>11.64</td>
<td>11.17</td>
<td></td>
</tr>
<tr>
<td>PCL-5 (post-treatment)</td>
<td>48</td>
<td>9.63</td>
<td>9.95</td>
<td></td>
<td>49</td>
<td>9.80</td>
<td>9.79</td>
<td></td>
</tr>
<tr>
<td>PCL-5 (follow-up)</td>
<td>18</td>
<td>8.22</td>
<td>8.57</td>
<td></td>
<td>16</td>
<td>11.63</td>
<td>12.88</td>
<td></td>
</tr>
</tbody>
</table>

*Note. N = 159. PTCI = PTSD Cognition Inventory. PCL-5 = PTSD Checklist for DSM-5. EW = expressive writing.*
Table 3

Lifetime Prevalence of Trauma Experiences

<table>
<thead>
<tr>
<th>Trauma Type</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural disaster</td>
<td>45</td>
<td>28.3</td>
</tr>
<tr>
<td>Motor vehicle and/or other serious accident</td>
<td>20</td>
<td>12.6</td>
</tr>
<tr>
<td>Combat exposure</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Sudden violent death of loved one</td>
<td>60</td>
<td>37.7</td>
</tr>
<tr>
<td>Self and/or loved-one survived life-threatening illness</td>
<td>70</td>
<td>44.0</td>
</tr>
<tr>
<td>Robbed with weapon</td>
<td>14</td>
<td>8.8</td>
</tr>
<tr>
<td>Physically assaulted</td>
<td>11</td>
<td>6.9</td>
</tr>
<tr>
<td>Witnessed physical assault by stranger</td>
<td>24</td>
<td>15.1</td>
</tr>
<tr>
<td>Threatened with bodily harm</td>
<td>30</td>
<td>18.9</td>
</tr>
<tr>
<td>Childhood physical abuse</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Witnessed family violence</td>
<td>35</td>
<td>22.0</td>
</tr>
<tr>
<td>Intimate partner violence</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>Childhood/adolescent sexual abuse</td>
<td>33</td>
<td>20.8</td>
</tr>
<tr>
<td>Adult sexual assault</td>
<td>20</td>
<td>12.6</td>
</tr>
<tr>
<td>Sexually harassed</td>
<td>38</td>
<td>23.9</td>
</tr>
<tr>
<td>Been Stalked</td>
<td>22</td>
<td>13.8</td>
</tr>
<tr>
<td>Miscarriage and/or abortion</td>
<td>14</td>
<td>8.8</td>
</tr>
</tbody>
</table>

*Note.* $N = 159.$
Manipulation Check

The percentage of emotion words used across sessions per participant were examined to ensure that participants followed the writing instructions. The mean of emotionality for the EW group was 2.72% ($SD = 1.00\%$) of total words. By comparison, the mean level of emotionality for the control group was 1.29% ($SD = 0.79\%$) of total words. These differences were statistically significant ($t = 11.02, p < .001$), suggesting that participants followed their respective instructions.

Hypothesis 1: Within- and Between-Group Differences in PTCI Scores

To test Hypothesis 1, a series of random regression models was estimated to determine whether the five conditions of HLM were satisfied. The null model indicated that there was systematic within- and between-group variance. PTCI scores were shown to vary significantly by condition ($\tau = 347.09, z = 3.99, p < .001$) and 40.5% of the total variance in PTCI scores was accounted for by differences between conditions. The random coefficient model indicated significant variance in mean PTCI scores across conditions after controlling for time ($\tau = 400.19, z = 3.85, p < .001$), but the slopes did not ($\tau = 98.48, z = 1.35, p = .179$). Since condition 2 was met, an intercepts-as-outcome model was performed. Results showed that the written disclosure condition did not significantly predict the variation in mean (adjusted) PTCI scores ($\gamma = 3.25, z = 0.79, p = .431$). The lack of significant variance in level-1 slopes implies that there was no remaining systematic variation in these slopes to be accounted for by written disclosure condition at level-2. Thus, the slopes-as-outcomes model was not computed and, as a result, the
cross-level interaction was not supported. This suggests that there were neither within- nor between-group differences in PTCI scores across sessions. A sensitivity analysis using study completers generated similar results.

Hypothesis 2: Simple Mediation Analysis

A mediation analysis was conducted to test whether Δ PTCI scores mediated the relationship between written exposure condition and Δ PCL-5 scores across approximately 14 days. Results of the mediation analysis are shown in Figure 3. Variables accounted for less than 0.1% of variance in Δ PTCI scores and 14.4% of variance in Δ PCL scores. While Δ PTCI scores significantly predicted Δ PCL scores, no other direct effects were statistically significant. Furthermore, neither the total effect nor indirect effect was statistically significant. The results of the sensitivity analysis were relatively similar, suggesting that these findings are robust.

Hypothesis 3: Conditional Process Analysis

Event centrality was hypothesized to moderate the direct and indirect effects of written exposure condition on Δ PCL-5 scores through Δ PTCI scores (see Table 4). Event centrality accounted for an additional 8.4% of variance in Δ PCL scores. Contrary to expectation, the direct and indirect effects were not conditioned on varying levels of event centrality.
Figure 3: Results of mediation model regressing changes in posttraumatic stress symptom (PTSS) severity from baseline to post-treatment on written disclosure condition (0 = expressive writing [EW], 1 = control) through changes in negative trauma-related appraisals. Coefficients are standardized estimates and the unconditional direct effect is in parentheses. The indirect effect was not significant ($\beta = .01, ns$, bias-corrected bootstrap 95% CI [-0.06, 0.09]).

*p < .05
Table 4

Conditional Process Analysis Predicting PTSS Severity (PCL-5) from Written Disclosure Condition and Negative Appraisals (PTCI)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$B$</th>
<th>$p$</th>
<th>95% CI</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Predicting Change in PTCI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written Disclosure Condition</td>
<td>3.69</td>
<td>.808</td>
<td>[-23.59, 36.98]</td>
<td>0.06</td>
</tr>
<tr>
<td>Centrality of Event Scale</td>
<td>0.90</td>
<td>.922</td>
<td>[-16.99, 19.16]</td>
<td>0.03</td>
</tr>
<tr>
<td>Interaction</td>
<td>-0.54</td>
<td>.928</td>
<td>[-13.41, 10.43]</td>
<td>-0.04</td>
</tr>
<tr>
<td><strong>Predicting Change in PCL-5</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written Disclosure Condition</td>
<td>-1.05</td>
<td>.849</td>
<td>[-11.80, 10.02]</td>
<td>-0.46</td>
</tr>
<tr>
<td>Centrality of Event Scale</td>
<td>-2.98</td>
<td>.474</td>
<td>[-11.01, 5.28]</td>
<td>-0.27</td>
</tr>
<tr>
<td>Change in PTCI</td>
<td>0.14</td>
<td>.001</td>
<td>[0.04, 0.21]</td>
<td>0.38</td>
</tr>
<tr>
<td>Interaction</td>
<td>-0.13</td>
<td>.955</td>
<td>[-4.90, 4.49]</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

Note. $N = 159$. PTCI = PTSD Cognition Inventory. PCL-5 = PTSD Checklist for DSM-5. CI = confidence interval. Interaction = written disclosure condition (0 = EW, 1 = Control) x centrality of event scale (mean-centered).
Supplementary Analyses

Supplementary analyses using HLM were performed to assess potential within- and between-group differences in PTCI scores and PCL-5 scores from baseline to follow-up for study completers ($N = 38$). Regarding PTCI scores, the null model showed systematic within- and between-group variance. There was significant variation in mean PTCI across conditions ($\tau = 399.14, z = 4.22, p < .001$), with 43.6% of the total variance accounted for by differences between conditions. The random coefficient model indicated significant variance in mean PTCI scores across conditions ($\tau = 394.34, z = 4.07, p < .001$), although the slopes did not vary significantly ($\tau = 28.41, z = 0.41, p = .686$). The intercepts-as-outcome model showed that the significant variance in mean PTCI scores was not predicted by written disclosure condition ($\gamma = 2.10, z = 0.50, p = .619$). Since there was no significant variance in the level-1 slopes, the slopes-as-outcomes model was not warranted. Thus, there was no support for either within- or between-group differences in PTCI scores across time among study completers.

With respect to PCL-5 scores, the null model indicated systematic within- and between-group variance and there was significant variation in mean PCL-5 scores between conditions ($\tau = 32.52, z = 3.37, p < .001$). Thirty-two percent of the total variance was accounted for by differences between conditions. While the random coefficient model showed significant variance in mean PCL-5 scores across conditions after controlling for time ($\tau = 32.68, z = 3.30, p = .001$), the slopes across conditions did not significantly vary ($\tau = 0.88, z = 0.05, p = .961$). The intercepts-as-outcomes model further demonstrated that variance in mean PCL-5 scores was significantly predicted by written disclosure condition ($\gamma = 0.22, z = 2.01, p = .045$).
Specifically, control participants reported higher mean PCL-5 scores at baseline than EW participants after controlling for time. Since there was no significant variance in the level-1 slopes, the slopes-as-outcomes model was not warranted. Despite between-group differences in baseline PCL-5 scores, results did not support within-group or cross-level interaction between time and written disclosure condition.

Post Hoc Analyses

A post hoc analysis was conducted to better understand the rate of attrition and factors that may have influenced the high attrition from baseline to follow-up. Survival analysis was performed to determine the rate at which attrition occurred. Attrition was characterized as the last time point for which data were available for any given participant (not including the 3-week follow-up). A discrete-time model was used given that time was measured in intervals. The Kaplan-Meier method of survival analysis compares the survival functions (or the cumulative proportion of participants that survive until the next time point) of one or more groups (Tabachnick & Fidell, 2007). In this study, the survival function of EW participants was compared to the survival function of control participants. The Kaplan-Meier analysis (as shown in Figure 4) showed that the rate of survival for control participants was generally higher than that of EW participants except at follow-up. These differences were not significantly different according to a log-rank test, $\chi^2(1, N = 159) = .21, p = .645$.

Cox regression was used to assess the effects of demographic characteristics (i.e., age, race, gender, education status), written exposure condition, event centrality, baseline PTSS
Figure 4: Cumulative probability of attriting as a function of written disclosure condition. Session number four corresponds with the 3-week follow-up assessment.
severity, level of emotional suppression during writing task (measured at baseline), and reactions
to participating in this study (i.e., Participation, Personal Benefits, Emotional Reactions,
Perceived Drawbacks, Global Evaluation) on attrition. Coefficient estimates describe the
relationship between covariates and the hazard of attrition. The exponentiation of these
coefficients represents the relative risk (or hazard ratio) of dropping out as compared to
remaining active in the study. Prior to computing the Cox regression, the assumption that the
rate of survival is constant across time (i.e., proportionality of hazards assumption) was tested
using a model in which interactions between covariates and the natural logarithm of time were
regressed on attrition (Tabachnick & Fidell, 2007). None of these interactions were significant,
indicating that the assumption was met. Covariates did not reliably predict attrition, $\chi^2(12, N =
159) = 3.22, p = .994$, providing limited information to inform possible reasons for participants
leaving this study.
CHAPTER 5
DISCUSSION

The primary goal of this study was to examine whether individual differences in event centrality influenced the effect of EW on the psychological functioning of trauma survivors. Due to the high rate of attrition at follow-up, study hypotheses were based on baseline and post-treatment data. Specific hypotheses were that: (1) there would be within- and between-group differences in negative trauma-related appraisals from baseline to post-treatment across written exposure condition (Hypothesis 1); (2) changes in appraisals from baseline to post-treatment would mediate the relationship between written disclosure condition and changes in PTSS severity from baseline to post-treatment (Hypothesis 2); and (3) the magnitude of the indirect effect would vary as a function of event centrality (Hypothesis 3). Regarding Hypothesis 3, it was hypothesized that EW participants disclosing about index traumas with high centrality would report a greater reduction in negative appraisals and PTSS severity at post-treatment relative to the control participants who were not expected to evidence any change regardless of the centrality level of their index traumas. A supplementary analysis using follow-up data was completed to provide information about the potential long-term effects of EW on study outcomes.

Study hypotheses were largely unsupported by present data. There were no within- or between-group differences in negative appraisals. Additionally, negative appraisals did not mediate the relationship between written disclosure condition and changes in PTSS severity.
There was, however, a significant relationship between negative appraisals and PTSS severity in the expected direction. Sensitivity analysis yielded similar results. Considering the non-significant mediation model, the null results of the conditional process model were anticipated.

It would have been preferable to investigate study hypotheses using follow-up data to gain better insight into the potential long-term effects of EW. However, there was an unexpectedly high percentage (71.6%) of participants missing data at follow-up. This raised concerns about having severely underpowered tests and biased results (Chakraborty & Gu, 2009). Instead, supplementary analyses were conducted using follow-up data to provide information about the long-term effects of EW on negative appraisals and PTSS severity. These results were also null and indicate that EW did not produce any enduring effects on outcome variables in the present study.

There are several possible reasons for the current null findings. There could have been problems with measurement, study design, and/or theory (Cronbach & Meehl, 1955). As described by Cronbach and Meehl (1955), constructs may not have been accurately measured by the tests utilized. Another possibility is that the theory on which the experiment was based could have been flawed. Finally, the experiment could have failed to test the hypothesized relationships. Each of these interpretations offers a plausible explanation as to why the stated hypotheses were not supported.
Potential Measurement Issues

Regarding construct measurement, it is plausible that every measure in this study neither accurately nor adequately assessed its intended constructs. For example, it is possible that PTSS severity scores were more reflective of general distress than trauma-related pathology. There is a subset of PTSD symptoms indicative of general, non-specific dysphoria (e.g., sleep disturbance, concentration difficulties, loss of interests in usual activities) found in other psychiatric conditions (Yufik & Simms, 2014). While exclusively endorsing these items would not qualify an individual for a diagnosis of PTSD, summing these items on a self-report measure of PTSD (such as the PCL-5) could be interpreted in relation to PTSS severity.

One possible solution might have been to compute the total severity of participants who endorsed at least moderate severity (PCL-5 rating ≥ 2) of PTSD-specific symptoms (e.g., intrusive memories, nightmares, flashbacks, avoidance of trauma-related stimuli) under the assumption that other endorsed symptoms might also reflect trauma-related pathology. Alternatively, it could have been helpful to add a follow-up question (e.g., “Do you think these symptoms are related to the traumatic event?”) after non-specific PTSD symptom items to differentiate these symptoms from general distress. The use of the latter approach would have to be weighed against the cost of fatigue potentially introduced by adding this repetitive follow-up question.

Another concern with using the PCL-5 is whether it is sensitive to short-term symptomatic change. The PCL-5 is widely used in clinical contexts to measure treatment progress, despite limited research on its accuracy for detecting symptomatic change. In one
study, Forbes, Creamer, and Biddle (2001) showed that the PCL demonstrated diagnostic accuracy in a sample of 97 Vietnam veterans at nine months post-treatment (as compared to the Clinician Administered PTSD Scale, a semi-structured clinical interview). Regarding symptom severity, the authors noted that participants appeared to underrate their symptom improvement. Thus, the PCL-5 may have underestimated the extent to which participants in the present study experienced symptom change. It is important to bear in mind, however, that the majority of participants reported minimal to no PTSS at each time point. Similar concerns can be raised about the PTCI.

Potential Theoretical Flaws

Another viable interpretation of these null findings is that the theory underlying study hypotheses was incorrect (Cronbach & Meehl, 1955). In this study, it was presumed that the traditional EW operates within the principles of emotional processing theory, yet there is no consensus on the exact theoretical model underlying the effects of EW (Baikie & Wilhelm, 2005; Sloan & Marx, 2004b). Pennebaker (2004) argues that there will likely never be a single theory to explain the power of writing given that it affects people on multiple levels – biological, cognitive, emotional, and social. Nevertheless, there are numerous theories that have been proposed, including catharsis theory (Scheff, 1979), emotional inhibition theory (Pennebaker, 1985, 1989), cognitive theory (Beck, Emery, & Greenberg, 2005; Ehlers & Clark, 2000; Park & Folkman, 1997; Park, Millis, & Edmondson, 2012), and emotional processing theory (Foa &
Each theory posits different mechanisms by which symptom change occurs and have varying levels of support for its viability as a theory for EW.

Pennebaker (1985, 1989) initially proposed emotional disinhibition as the mechanism by which EW conferred its effects. This theory draws heavily from animal and psychophysiological data showing that stress associated with active inhibition elicits increased autonomic and central nervous system activity, which increases risk for disease and other stress-related illnesses (Pennebaker, 1997). He argued that disclosing trauma-related thoughts and feelings (via EW or talking) improved physiological functioning by relieving stress that had accumulated from actively inhibiting these internal experiences. This theory has mixed empirical support (Baikie & Wilhelm, 2005; Sloan & Marx, 2004b). Studies have found a link between EW and improved physiological health and immune functioning (e.g., Booth, Petrie, & Pennebaker, 1997; Cohen & Williamson, 1991; Esterling et al., 1994; Pennebaker, Kiecolt-Glaser, & Glaser, 1988; Petrie, Booth, Pennebaker, Davison, & Thomas, 1995). However, it has not been established whether emotional disinhibition mediates this relationship. In fact, there is evidence that EW produces beneficial health outcomes after writing about previously disclosed events (Greenberg & Stone, 1992; Pennebaker, 1989). Contradictory evidence such as this has resulted in a shift away from the emotional inhibition theory and towards other viable theories.

Similar to Pennebaker’s (1985, 1989) emotional inhibition theory, the catharsis theory (Scheff, 1979) has received limited empirical support. This theory emphasizes the importance of venting negative emotions. Direct evidence against this theory is the robust finding that EW increases negative affect immediately following writing sessions as opposed to producing instant relief (Smyth, 1998). Smyth (1998) also found that health outcomes were not predicted by the
amount of emotion or distress endorsed following the writing, further disconfirming emotional catharsis as a mechanism of change. Pennebaker and Beall (1986) showed in their pioneering study that only writing about emotions was less effective than writing about emotions and thoughts. This highlights the importance of cognitive and emotional processing within EW.

From a cognitive perspective (also termed cognitive adaptation or cognitive processing theory), EW allows individuals to organize and structure their trauma memories in such a way that corrects erroneous schemas (Harber & Pennebaker, 1992; Pennebaker, 1997; Smyth, True, & Souto, 2001). That is, the process of developing trauma narratives promotes the cognitive process of accommodation, i.e., modifying existing beliefs about one’s self, others, and the world by integrating the trauma-related information. It has been challenging to evaluate a cognitive theory of EW due to difficulties with measuring cognitive change. Thus far, researchers have used linguistic indices (e.g., percentage of words that reflect self-reflective thinking and causation; Pennebaker, Mayne, & Francis, 1997), structure of written narratives, and cognitive appraisals as proxies for cognitive change. Pennebaker and Francis (1996) found that increases in the use of causal-related (e.g., because, effect, cause, reason) and insight-related (e.g., think, realize, understand, consider) words across writing sessions predict improved physical health at follow-up. Similarly, Rivkin et al. (2006) showed that increased use of insight and causation words were associated with better immune functioning among HIV-positive men and women. Positive changes in the types of words used in written narratives across sessions imply that individuals are generating new insights in response to the writing. However, one major drawback of text analysis software is that it cannot fully reflect the nuances of cognitive restructuring (Sloan & Marx, 2004b). Rating systems are also less than ideal for assessing the
overall level of change in narratives across time (Park & Blumberg, 2002). The limitations of these approaches illustrate the complexity of capturing cognitive processes using a single strategy. A multimethod approach combining these and other relevant approaches might prove more beneficial.

Another aspect of cognitive change that has been examined is the structure of the narrative. Smyth and colleagues (2001) examined the importance of narrative formation by manipulating how essays were written. One-hundred and sixteen undergraduate students were randomly assigned to either a control writing condition or one of two EW conditions. In one EW condition, participants were asked to list their deepest feelings and thoughts in a fragmented, outline format. In the other EW condition, participants wrote their deepest feelings and thoughts as a narrative. Results showed that the fragmented group was not statistically different from the control group on health variables at follow-up. By comparison, the narrative group evidenced less illness-related restriction of activity at follow-up, suggesting that narrative formation is a necessary ingredient for an effective EW intervention. An unexpected finding was that the narrative group reported higher PTSD-related avoidance than the other groups. This finding is not necessarily surprising. It is reasonable to expect that individuals confronting highly distressing traumatic events in a single session might exhibit heightened avoidance post-writing. Negative affect often increases following EW sessions and trauma survivors often attempt to control aversive internal experiences through avoidant behavior (e.g., Marx & Sloan, 2005). Frattaroli (2006) noted that the number of sessions is another critical component of effective EW. Thus, avoidance might have declined after multiple sessions, but the authors expressed
concerns that the fragmented group would unintentionally develop a narrative across numerous sessions. Danoff-Burg, Mosher, Seawell, and Agee (2010) reported similar findings.

An extension of cognitive theory posits that traumatic events not only violate pre-existing beliefs but also disrupt important life goals (Park & Folkman, 1997; Park et al., 2012). This revised model, also known as the meaning-making hypothesis or cognitive worldview model, emphasizes how violations of beliefs and/or life goals following trauma exposure cause discrepancies in worldviews that negatively impact subsequent functioning. The meaning-making hypothesis has six tenets: (1) everyone has orienting systems (herein referred to as global meaning) that provide the cognitive framework from which they interpret their experiences and draw motivation, (2) when confronted with situations that conflict with their global meaning, individuals will assign meaning to those situations, (3) subsequent distress is contingent upon the extent to which the appraised meaning of that situation is discrepant from global meaning, (4) the distress caused by the discrepancy initiates a process of meaning making, (5) individuals attempt to reduce the discrepancy between the appraised and global meaning through meaning making with the intentions of restoring meaning to their lives and their world, and (6) this process, when successful, results in better post-trauma adjustment (Park, 2010). While aspects of the cognitive worldview model have been supported (e.g., attempts to reconcile discrepancies between situational and global meaning, relationship between situational/global meaning and subsequent functioning), other aspects remain untested (e.g., distress initiates meaning making, changes in situational and global meaning over time as a result of meaning making; Park, 2010). Park and Blumberg (2002) found that situational appraisals improved from baseline to follow-up for disclosure participants, but these changes were unrelated to self-reported emotional and physical
health outcomes. As Sloan and Marx (2004b) point out, situational appraisals were only examined for the disclosure condition, making it difficult to discern whether the experimental condition contributed to changes in appraisals. In sum, cognitive mechanisms theoretically seem to underlie the benefits of EW. However, difficulties with defining and measuring those cognitive changes associated with EW have hindered advancements in this theory.

Compared to the other proposed theories, emotional processing theory has been the most researched in relation to EW. Foa (1997) asserted three necessary conditions for exposure-based treatments to reduce PTSS severity – promotes emotional engagement that leads to habituation, modifies cognitive appraisals about the self and world, and improves trauma memory coherency. Although one study showed null results (Sloan et al., 2011), others have found evidence of emotional habituation among EW participants across sessions (Sloan & Marx, 2004a; Sloan, Marx, Epstein, & Lexington, 2007; Smyth et al., 2008). Nazarian and Smyth (2013) showed that participants following an EW exposure-like protocol not only evidenced emotional habituation to the trauma memory but also demonstrated increased cognitive processing (as evidenced by greater use of cognitive insight words). Linguistic indices support the development of coherent narratives through variations in pronoun use, suggesting a possible difference in how individuals view themselves in relation to themselves, others, and the world (Baikie & Wilhelm, 2005). Additionally, writing promotes coherent narrative structure after multiple repetitions (Kaufman & Sexton, 2006; Niederhoffer & Pennebaker, 2009).

Overall, there is merit to Pennebaker’s (2004) claim that EW affects change on multiple levels. The EW prompts can easily be adapted to fit any theoretical framework (e.g., Danoff-Burg et al., 2010; Meston et al., 2013; Sloan et al., 2007; Smyth et al., 2008). Although
alterations in the EW instructions have relatively no effect on outcomes (Frattaroli, 2006), researchers should be aware that changing the instructions in accordance with a specific theoretical orientation could activate unintended processes (Nazarian & Smyth, 2013).

Potential Research Design Flaws

While it is difficult to pinpoint an exact reason for the null findings in this study, problems with the methodological design seem to be the most likely culprit. The self-report measures may not have accurately captured negative appraisals, PTSS severity, trauma history, or event centrality. However, the measures in this study are widely used within trauma research, suggesting that the measurement issues in this study are not unique. Furthermore, study hypotheses were based on the most empirically supported theory of EW to date – emotional processing theory. Methodological flaws provide the best rationale for the null findings.

Even though the present study implemented many recommendations suggested by Frattaroli (2006) to produce optimal results (e.g., three writing sessions, self-selected trauma), there were still several limitations to the study design that could have contributed to the lack of significant findings. Most notable were the participant selection strategies. A convenience sample of college students was utilized with the expectation that participants would evidence enough variability on study variables to detect any significant relationships among these variables. Participants were included in this study if they were at least 18 years old, fluent in English, and endorsed exposure to at least one traumatic event during mass testing. A minimum PTSS severity score was not required based on evidence that prevalence rates of PTSD are
generally low in college samples (Elhai et al., 2012). Less than 5% of the present sample endorsed clinically significant PTSS severity (PCL-5 severity score > 31; Blevins et al., 2015). Thus, not recruiting based on a specific cutoff score may have limited the ability to observe decreases in PTSD symptoms across time.

Relative to the EW intervention, it was assumed that participants would select their most distressing event. Without the assistance of the experimenter, participants with repeated trauma exposure could have selected events that were more emotionally tolerable. Participants were informed at the outset of the study that they might have to write about a stressful life situation, which could have influenced their decision. Interestingly, although EW essays had a greater percentage of emotion words than control essays, essays contained less than 10% emotion words (both positive and negative) across conditions. This suggests that EW participants may not have been emotionally engaged during the exercise. Exposure therapy sessions are typically 90 minutes with 45-60 minutes of imaginal exposure. Participants in this study wrote for 15 minutes, which is considerably shorter in length. The WET treatment sessions involve 30 minutes of written exposure (Sloan et al., 2013; Sloan et al., 2012). Therefore, participants may not have had an opportunity to achieve emotional habituation. It could be beneficial for future studies to investigate the necessary length of written exposure sessions to elicit emotional reactivity to promote habituation.

Of equal importance is accurately assessing the most distressing traumatic event contributing to PTSS severity. Participants had minimal contact with experimenters and were allowed to freely choose their index trauma. A small percentage of participants denied trauma exposure (as measured by the TLEQ) at the baseline session despite indicating previous trauma
exposure (as measured by the LEC-5) at the mass screening. There are some differences between the TLEQ and LEC-5 regarding descriptions of potentially traumatic events and the types of events listed. The LEC-5 describes broad categories of traumatic events with short phrases (e.g., “fire or explosion”). By comparison, the TLEQ provides more detailed descriptions of a wider range of events (e.g., “Have you been involved in any other kind of accident in which you or someone else was badly hurt? [e.g., a plane crash; a drowning or near drowning; an electrical or machinery accident; an explosion; home fire; chemical leak; overexposure to radiation or toxic chemicals]”). There are overlapping items, but also unique items. Therefore, if a person endorsed “captivity” on the LEC-5 as their singular traumatic event, they might not mark anything on the TLEQ. On the other hand, they might endorse events on the TLEQ that were characteristic of their captivity, such as physical or sexual assault. It would have been better to use the same self-report measure to assess trauma history.

A very important limiting factor was the considerable rate of attrition at follow-up. Although attrition is to be expected in longitudinal studies, a dropout rate of over 70% seems unusual for an EW study. Dropout rates were fewer than 20% in other EW studies using a trauma sample (Brown & Heimberg, 2001; Sayer et al., 2015; Sloan & Marx, 2004a; Sloan et al., 2011, 2013; Smyth et al., 2008), except for two studies. Meston et al. (2013) retained less than 50% of their sample after three follow-up assessments that extended across six months, which likely contributed to their high rate of attrition. Bragdon and Lombardo (2012) reported the highest dropout rate with less than 40% of their sample completing the three-month follow-up assessment. The authors believed that the combination of EW with an active SUD treatment influenced the high attrition rates.
There are numerous reasons why participants prematurely leave a study, including withdrawal from study, refusal to participate, lost to follow-up contact, and incompatibility with the research team (Scott, Sonis, Creamer, & Dennis, 2006). Gathering information about those reasons can be particularly challenging and investigators may rely on examining potential differences between completers and noncompleters on demographic characteristics and study variables. In this study, post hoc survival analyses showed comparable rates of dropout across conditions. In addition, none of the demographic characteristics, study variables, or reactions to participating predicted attrition. Thus, there were likely other unmeasured factors (e.g., motivation) impacting attrition.

A workgroup appointed by the National Research Council outlined a variety of strategies for preventing and managing missing data in clinical research (National Research Council, 2010). Beginning with study design, the workgroup recommends clearly defining the target population and treatment outcomes to maximize the number of participants who are retained in the study. The workgroup argues that the measures used should be meaningful for all participants and that study protocols should detail approaches for handling missing data. It has become standard practice to take an intent-to-treat (ITT) approach for analyzing clinical trials (Moher, Schulz, & Altman, 2001; Montori & Guyatt, 2001; Schulz, Altman, & Moher, 2010). ITT is the practice of analyzing data for all randomized participants regardless of treatment adherence, the type of treatment received, or subsequent withdrawal or deviation from the study protocol (Fisher et al., 1990). Present findings were based on a modified ITT sample (i.e., participants who completed at least one writing session) since eligible participants who never participated were excluded (Montedori et al., 2011). There are a variety of statistical analytic
approaches that can account for these missing data. Data imputation methods (e.g., last observation carried forward, multiple imputation) are popular but should only be used when the underlying assumptions are justified (National Research Council, 2010). Advanced statistical modeling techniques, such as HLM, provide an alternative, more efficient approach for analyzing longitudinal (or repeated-measures) data than traditional statistical methods (e.g., ordinary least-squares regression, ANOVA).

Because attrition can never be eliminated, the workgroup describes several design elements that may reduce participant dropout throughout data collection. For example, the workgroup emphasizes the importance of selecting the appropriate target population and assessing participants prior to randomization to determine which ones may not tolerate or respond well to the study treatment. Other strategies include reducing the follow-up periods, individualizing patients’ doses (i.e., a titration approach), and randomly selecting which participants will be asked to withdraw or continue with follow-up assessments. It may be tempting to discontinue data collection with participants who drop out. However, the workgroup strongly recommends continuing to collect information on key outcomes unless contraindicated by a cost-benefit analysis.

Even with many of these recommendations employed, the high rate of attrition at the 3-week follow-up assessment might have remained unchanged. Participants were recruited from an introductory psychology subject pool and their motivation for participating in research studies was partly driven by having to fulfill a research requirement for partial course credit. While participants were eligible for research credits following each component of this study, they may have been less interested in completing this study if their research requirement had been met at
any point during data collection. The midwestern university at which data was collected imposes restrictions on the number of research credits students can receive from completing online studies. This encourages equal participation in online and in-person research studies. Thus, during the three weeks (or longer in the case on study non-completers) between the last writing session and follow-up online survey, participants could have obtained the maximum number of research credits from online studies and found little value in completing an uncreditable online survey. Students who received the survey after the semester had ended may have also felt less obligation to complete the follow-up survey for that reason. A monetary prize was offered in addition to research credits to increase motivation, especially in the latter two scenarios, but it did not mitigate attrition at follow-up. Accordingly, it might have been beneficial to recruit qualifying non-introductory students who might not have the same course obligations as introductory psychology students.

Limitations

The present study had many notable limitations, some of which have previously been discussed. As noted by the National Research Council (2010), selecting the appropriate target population is a critical step when developing study protocols. One limitation of this study was that participants were not required to meet a predetermined cutoff score for PTSS severity. This initial decision was based on prior research indicating that college students generally endorse low rates of PTSD (Elhai et al., 2012). Not surprisingly, the sample was relatively healthy and present findings may not be representative of individuals with clinically significant levels of
PTSS. Future studies should consider utilizing a minimal cutoff score for at least subthreshold PTSD to ensure that changes in severity can be detected across time. Another related limitation was that study findings were based on college students and, thus, may not generalize to the broader adult population. Attrition at follow-up was already discussed as a major limitation that might have been prevented with better recruitment strategies or by screening for participants with the least potential to drop out (National Research Council, 2010).

Implications and Future Directions

The primary objective of the present study was to examine the role of event centrality on PTSS severity following a brief EW intervention. It was expected that EW would evoke changes in negative appraisals that would result in lower PTSS severity, especially for EW participants disclosing about events with high event centrality. Present data did not support this presumption. Although present findings are consistent with other research documenting a null effect of EW on PTSS severity and other related variables (Brown & Heimberg, 2001; Sloan et al., 2011; Smyth et al., 2008), it is difficult to compare these results to other EW studies directly due to methodological differences between studies (Frattaroli, 2006). In this study, EW participants were free to write about any traumatic event (past or current) instead of a pre-assigned topic (e.g., childhood abuse, rape; Bernard et al., 2006; Brown & Heimberg, 2001; Meston et al., 2013). Other studies have made substantial modifications to the typical EW prompt and modeled them after treatment protocols that incorporated elements of written disclosure with cognitive restructuring (Meston et al., 2013; Smyth et al., 2008). The present study utilized
prompts that are consistent with the traditional EW approach (i.e., freely writing thoughts and feelings associated with a traumatic event). A few studies (not including this one) instructed EW participants to read their narratives aloud in solitary or to an experimenter (Brown & Heimberg, 2001; Gidron et al., 1996; Meston et al., 2013). Across all studies, sessions ranged in number, length, and spacing as well as follow-up assessments. While the length and spacing of sessions does not appear to have a substantial impact on outcomes, the number of writing sessions does. Fewer than three sessions have been associated with poorer psychological outcomes than three and more sessions (Frattaroli, 2006). Only one study has fewer than three sessions (Brown & Heimberg, 2001). Another study had three sessions; however, they were conducted within a single day (Smyth et al., 2008). Timing of follow-up may be as important as the number of sessions. Follow-up assessments administered within the first month following the experiment were related to larger psychological health effect sizes than follow-up assessments administered after the first month (Frattaroli, 2006). Follow-up in the present study occurred at least three weeks following the last completed writing session.

Given the wide array of discrepancies, it may be worthwhile to establish an EW procedure for PTSD that can be implemented similarly across studies. Sloan and colleagues were the first to undertake this feat by establishing a standardized EW protocol (i.e., WET; Sloan et al., 2012). Preliminary findings for WET are promising; yet these findings are limited to combat veterans and motor vehicle accident survivors (Sloan et al., 2012, 2013). Replicating these studies in other trauma populations will provide better insight about the generalizability of these findings.
Regarding present findings, the lack of within- and between-group differences in negative appraisals may reflect that participants did not receive an adequate dose of the EW procedure given that these analyses were based on an intent-to-treat sample that included more than 50% study noncompleters. However, sensitivity analyses yielded similar findings, indicating that three writing sessions may not be sufficient for producing the expected changes in negative appraisals. Another possibility is that EW participants were writing about older events which they had satisfactorily processed. Most index events last occurred more than four years ago. As suggested by Frattaroli (2006), writing about older traumatic events diminishes the effectiveness of EW because these events have likely been processed and accurately integrated into existing schemas (a process known as accommodation). The relatively low levels of negative appraisals reported in both conditions further support this presumption. Their PTCI scores were, on average, more than one standard deviation below those of clinical samples from other studies (Foa et al., 1999; Rauch et al., 2009).

Any remaining negative appraisals may have represented a failure to adequately consolidate trauma-related information with pre-existing beliefs. Following a traumatic event, individuals may integrate or modify new trauma-related information so that it is consistent with existing schemas (Resick & Schnicke, 1993). This process is known as assimilation. An example of an assimilated belief would be a female sexual assault victim concluding that, because she was victimized, she must be a bad person due to her strong preconceived belief about the world as just (i.e., “Good things happen to good people and bad things happen to bad people”). Alternatively, she may presume that she can never trust another person or that bad things will always happen to her. New beliefs such as these depict overaccommodation, which is
when the incorporation of trauma-related information leads to schema changes that are inaccurate and overgeneralized (Resick & Schnicke, 1993). Once assimilated and overaccommodated beliefs become ingrained into an individual’s schemas, they will be more resistant to change and likely contribute to persistent distress. Therefore, it would likely require more than three 15-minute writing sessions to effect change in these types of appraisals. Sloan and colleagues (2012) suggest five sessions with 30 minutes of writing to reduce arousal and negative affect among patients with PTSD. Further research is needed to determine the optimal number of sessions needed to evoke clinically significant changes in trauma-related appraisals (especially for assimilated and overaccommodated beliefs).

One significant finding was the positive association between negative appraisals and PTSS severity. Negative appraisals have been shown to play an essential role in the etiology and persistence of PTSD (Bryant & Guthrie, 2005, 2007; Clohessy & Ehlers, 1999; Dunmore et al., 1999, 2001; Ehlers et al., 2000; Fairbrother & Rachman, 2006; Halligan et al., 2003; Lancaster et al., 2011; Laposa & Alden, 2003; O’Donnell et al., 2007). Further, changes in negative appraisals throughout the course of treatment are associated with greater PTSS severity reduction (e.g., Kleim et al., 2013; McLean, Yehuda, Rosenfield, & Foa, 2015; Zalta et al., 2014). The lack of change in negative appraisals and, consequently, PTSS severity in this study does not discredit negative appraisals as a potential mechanism of change for EW. As stated above, three sessions may not be sufficient for disconfirming firmly held negative beliefs.

Despite the null findings related to event centrality, this construct may still have implications for improving trauma-focused treatment. PTSD assessments and treatment protocols often focus on a worst identified index trauma. This can be problematic for victims of
repeated trauma exposure who may struggle to choose an index event. Additionally, it may be challenging to distinguish which symptoms are related to a singular trauma, given the cumulative effect of repeated trauma exposure (Breslau, Chilcoat, Kessler, & Davis, 1999; Briere, Kaltman, & Green, 2008; Cloitre et al., 2009; Cougle, Resnick, & Kilpatrick, 2009; Frans, Rimmö, Åberg, & Fredrikson, 2005; Kimerling, Alvarez, Pavao, Kaminski, & Baumrind, 2007; Krupnick et al., 2004; Nishith, Mechanic, & Resick, 2000). Thus, it would be worthwhile to continue developing and testing the clinical utility of instruments that measure event centrality. For example, a brief clinical interview assessing event centrality could help clinicians and clients determine which events may be useful to target in treatment.

To gain a better understanding of the role of event centrality on PTSD treatment outcomes, it would be beneficial to manipulate event centrality in clinical and subclinical populations using different PTSD treatments. A recent study by Boals and Murrell (in press) showed that event centrality could be experimentally manipulated using a modified version of Acceptance and Commitment Therapy (ACT). The modified four-session treatment primarily focused on the self-as-context process of the ACT model in a community sample of trauma survivors. Their findings provide direct evidence of a causal link between event centrality and PTSS severity. Another potential method could involve having trauma survivors with repeated trauma exposure identify two potential index events – one with high event centrality and another with relatively low event centrality. Through random assignment, participants could then be asked to complete treatment based on the index event with either low or high event centrality. Implementing this study design using different, yet effective PTSD treatments would provide
valuable information about the circumstances under which treatment is enhanced by targeting traumatic events with high event centrality.

This study could have utilized any PTSD treatment; however, there were several advantages to using an EW intervention. Although EW was not associated with symptom reduction in the present study, several other studies have shown that EW reduces PTSS severity in addition to secondary outcomes (Bernard et al., 2006; Bragdon & Lombardo, 2012; Meston et al., 2013; Sayer et al., 2015; Schoutrop et al., 2002; Sloan et al., 2013; Sloan & Marx, 2004a; Sloan et al., 2012). Compared to standard treatments for PTSD, EW is relatively brief, cost-effective, and easily disseminated. There is no prescribed number of sessions (so long as a minimum of three sessions are completed), which allows for the intervention to be individualized to meet diverse client needs. Per the recommendation of the National Research Council (2010), tritritated treatments may prevent attrition in treatment outcome research. One possible drawback to this approach is the lack of therapist contact. WET, a variant of EW, involves some therapist contact for orienting individuals to session content and processing reactions to writing assignments. Future studies may examine the extent which therapist contact is necessary for EW. Additionally, further research examining the effectiveness of EW as a trauma-focused treatment as well as the conditions under which it is most effective would be beneficial. To advance this research, it will be equally important to compare the effects of EW to other active PTSD treatments (e.g., exposure therapy, cognitive therapy) or by examining which aspects of the intervention (e.g., emotional expression, indirect exposure to trauma memory) contribute to its effectiveness.


Boals, A. (2010). Events that have become central to identity: Gender differences in the centrality of events scale for positive and negative events. *Applied Cognitive Psychology, 24*, 107-121. doi:10.1002/acp.1548


APPENDIX A

INFORMED CONSENT (LABORATORY SESSIONS)
I agree to participate in the research project entitled “The Impact of Writing on Health Functioning” being conducted by Derrecka Boykin, a graduate student at Northern Illinois University. I have been informed that the purpose of this study is to understand how writing impacts psychological and physical well-being.

I understand that if I agree to participate in this study, I will be asked to complete various activities over the course of two weeks. I will be asked to answer questions that will assess my current mental and physical health, mood, exposure to stressful life events, coping strategies, and reactions to research participation. I will also be asked to write about stressful life experiences or future plans. My participation in this study will contribute to our understanding of adaptive coping methods for stress and will assist in the development of intervention programs. The first session will last approximately 45 minutes while subsequent sessions will last 20-30 minutes. Upon completion of the three laboratory sessions, I am informed that I will receive 4 experimental points toward partial course credit in Introduction to Psychology (PSCY 102). I understand that I will also receive one draw in a drawing for three $25 awards for every laboratory session completed. Three weeks following the laboratory session, I will be emailed a link to an online survey where I can receive 1 additional experimental point toward partial course credit and one additional draw in a drawing for three $25 awards.

I understand that any information gathered during this research study is intended to be used for research purposes only and I understand that the researcher, for the purposes of this research, does not have authority to address, or a duty to report, sexual violence, misconduct or harassment. If I wish to report an instance of sexual violence, misconduct or harassment, I understand that I need to contact the University’s Title IX Coordinator, Karen L. Baker, at 815-753-6017 or kbaker@niu.edu, or visit the University’s Title IX website at http://www.niu.edu/sexualmisconduct/help/report.shtml for other reporting options.

I understand that all information gathered during this experiment will be kept in the strictest confidence and will not be available to anyone other than the experimenters conducting the study. I am aware that all information gathered will be kept in password-protected, encrypted electronic files that will be stored on computers locked in a secure location. I also understand that consent forms and writing packets will be kept in a locked filing cabinet in a secure location.

I understand that potential risks for participating include experiencing distressing thoughts and feelings in response to study materials related to trauma history and/or mental health. I know that I can speak with an advanced clinical psychology graduate student trained to manage emergency situations should I need immediate assistance. I know that I can also contact the 24-hour Crisis Line at (815) 758-6655 at any time if I become distressed. I understand that I will receive an additional list of numbers to local counseling resources should I need to further process any upsetting feelings or thoughts that arise from participating in this study.

I also understand that my participation is voluntary and I may withdraw at any time without penalty or prejudice. I know that if I have any additional questions concerning this study, I may contact Derrecka Boykin at (630) 755-5056 or Dr. Holly Orcutt, Graduate Advisor, Department of Psychology, Northern Illinois University, at (815) 753-5920 during standard business hours.

I realize that my consent to participate in this project does not constitute a waiver of any legal actions or redress I might have as a result of my participation. If I wish to have further information regarding my rights as a research subject, I may contact the Office of Research and
Compliance (ORC) at Northern Illinois University at (815) 753-8588 or visit their website at www.orci.niu.edu/orci/. I acknowledge that I have received a copy of this consent form.

Participant’s name – PRINTED
Witness’ name – PRINTED

Participant’s signature and date
Witness’ signature and date

Consent to Future Contact

__________ I would like to be contacted about future opportunities to participate in additional research with no obligation to participate. My contact information is as follows:

Contact information:
Name: __________________________________________
Address: _________________________________________
Phone: ___________________________ Email: _______________________

Participant’s name – PRINTED
Witness’ name – PRINTED

Participant’s signature and date
Witness’ signature and date
APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE
Please answer the following:

1. In what year were you born (please enter 4 digits – 19XX)? (YYYY)

2. In what month were you born?
   a. January
   b. February
   c. March
   d. April
   e. May
   f. June
   g. July
   h. August
   i. September
   j. October
   k. November
   l. December

3. On what date were you born (please enter a number between 1 and 31 – for example, if you were born on March 30th, enter 30)? ___

4. What is your gender?
   a. Male
   b. Female
   c. Prefer not to respond

5. What is your race?
   a. American Indian/Alaskan Native
   b. Asian or South-Asian
   c. Black or African American
   d. Native Hawaiian/Pacific Islander
   e. White or Caucasian
   f. Not listed: ______________________
   g. Prefer not to respond

6. Do you identify as Latino/a, Hispanic, or being of Spanish origin?
   a. Yes
   b. No
   c. Prefer not to respond

7. What year in school are you?
   a. Freshman
   b. Sophomore
   c. Junior
   d. Senior
   e. At-large
   f. Graduate Student
   g. Other: ______________________
   h. Prefer not to respond
8. Are you currently receiving treatment (e.g., psychotherapy, medication) for emotional/psychological problems (e.g., depression, anxiety)?
   a. Yes
   b. No
   c. Prefer not to respond

9. If so, what type of treatment are you receiving?
   a. Psychotherapy
   b. Medication
   c. Both
   d. Prefer not to respond
APPENDIX C

LIFE EVENTS CHECKLIST FOR DSM-5 (LEC-5)
Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it *happened to you* personally; (b) you *witnessed* it happen to someone else; (c) you *learned about it* happening to a close family member or close friend; (d) you were exposed to it as *part of your job* (for example, paramedic, police, military, or other first responder); or (e) you’re *not sure* if it fits.

Be sure to consider your *entire life* (growing up as well as adulthood) as you go through the list of events.

<table>
<thead>
<tr>
<th>Event</th>
<th>Happened to me</th>
<th>Witnessed it</th>
<th>Learned about it</th>
<th>Part of my job</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Natural disaster (for example, flood, hurricane, tornado, earthquake)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fire or explosion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Serious accident at work, home, or during recreational activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Exposure to toxic substance (for example, dangerous chemicals, radiation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Physical assault (for example, attacked, hit, slapped, kicked, beaten up)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Other unwanted or uncomfortable sexual experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Combat or exposure to war-zone (in the military or as a civilian)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Life-threatening illness or injury</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Severe human suffering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Sudden violent death (for example, homicide, suicide)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Sudden accidental death</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Serious injury, harm, or death you caused to someone else</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

TRAUMATIC LIFE EVENTS QUESTIONNAIRE (TLEQ)
The purpose of this questionnaire is to identify important life experiences that can affect a person’s emotional well-being or later quality of life. The events listed below are far more common than many people realize. Please read each question carefully and check the response that best describes your experience.

1. Have you ever experienced a natural disaster (flood, hurricane, earthquake)?

   [ ] Never  [ ] Once  [ ] Twice  [ ] 3 Times  [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond

   If this happened:
   1a. Did you experience intense fear, helplessness, or horror when it happened?
      [ ] Yes  [ ] No  [ ] Prefer not to respond
   1b. Were you seriously injured?
      [ ] Yes  [ ] No  [ ] Prefer not to respond
   1c. Was someone you cared about or were close to seriously injured or killed?
      [ ] Yes  [ ] No  [ ] Prefer not to respond
   1d. Did you think you or a loved one was in danger of being killed by the disaster?
      [ ] Yes  [ ] No  [ ] Prefer not to respond

2. Were you involved in a motor vehicle accident for which you received medical attention or that badly injured or killed someone?

   [ ] Never  [ ] Once  [ ] Twice  [ ] 3 Times  [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond

   If this happened:
   2a. Did you experience intense fear, helplessness, or horror when it happened?
      [ ] Yes  [ ] No  [ ] Prefer not to respond
   2b. Were you seriously injured?
      [ ] Yes  [ ] No  [ ] Prefer not to respond

3. Have you been involved in any other kind of accident in which you or someone else was badly hurt? (e.g., a plane crash; a drowning or near drowning; an electrical or machinery accident; an explosion; home fire; chemical leak; overexposure to radiation or toxic chemicals)

   [ ] Never  [ ] Once  [ ] Twice  [ ] 3 Times  [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond
If this happened:

3a. Did you experience intense fear, helplessness, or horror when it happened?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

3b. Were you seriously injured?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

4. Have you lived, worked, or had military service in a war zone?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

If yes:

4a. Were you ever exposed to warfare or combat (e.g., in the vicinity of a rocket attack or people being fired upon; seeing someone get wounded or killed)?
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times    [ ] More than 5 Times    [ ] Prefer not to Respond

If this happened:

4b. Did you experience intense fear, helplessness, or horror when it happened?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

4c. Were you seriously injured?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

5. Have you experienced the sudden violent death of a close friend or loved one [e.g., homicide, suicide]?
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times    [ ] More than 5 Times    [ ] Prefer not to Respond

5a. Due to accident?
   [ ] Yes    [ ] No    [ ] Prefer not to respond
5b. Due to illness?
   [ ] Yes    [ ] No    [ ] Prefer not to respond
5c. Due to suicide?
   [ ] Yes    [ ] No    [ ] Prefer not to respond
5d. Due to murder?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

If this happened:

5e. Did you experience intense fear, helplessness, or horror when it happened?
   [ ] Yes    [ ] No    [ ] Prefer not to respond

6. Has a loved one ever survived a life threatening or permanently disabling accident, assault, or illness? (e.g., spinal cord injury, rape, cancer, life threatening virus, serious heart condition)
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times    [ ] More than 5 Times    [ ] Prefer not to Respond

If this happened:

6a. Did you experience intense fear, helplessness, or horror when it happened?
7. Have you ever had a life threatening illness?
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond

If this happened:
   7a. Did you experience intense fear, helplessness, or horror when it happened?
      [ ] Yes       [ ] No       [ ] Prefer not to respond

8. Have you been robbed or been present during a robbery in which the robber(s) used or displayed a weapon?
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond

If this happened:
   8a. Did you experience intense fear, helplessness, or horror when it happened?
      [ ] Yes       [ ] No       [ ] Prefer not to respond
   8b. Were you seriously injured?
      [ ] Yes       [ ] No       [ ] Prefer not to respond

9. Have you ever been hit or beaten up and badly hurt by a stranger or someone you didn’t know very well?
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond

If this happened:
   9a. Did you experience intense fear, helplessness, or horror when it happened?
      [ ] Yes       [ ] No       [ ] Prefer not to respond
   9b. Were you seriously injured?
      [ ] Yes       [ ] No       [ ] Prefer not to respond

10. Have you seen a stranger (or someone you didn’t know very well) attack or beat up someone and seriously injure or kill him or her?
    [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
    [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond

If this happened:
   10a. Did you experience intense fear, helplessness, or horror when it happened?
      [ ] Yes       [ ] No       [ ] Prefer not to respond

11. Has anyone threatened to kill you or cause you serious physical harm?
   [ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
   [ ] 5 Times  [ ] More than 5 Times  [ ] Prefer not to Respond
11a. A stranger? [ ] Yes [ ] No [ ] Prefer not to respond
11b. A friend or acquaintance? [ ] Yes [ ] No [ ] Prefer not to respond
11c. A relative? [ ] Yes [ ] No [ ] Prefer not to respond
11d. An intimate partner? [ ] Yes [ ] No [ ] Prefer not to respond

If this happened:
11e. Did you experience intense fear, helplessness, or horror when it happened?
[ ] Yes [ ] No [ ] Prefer not to respond

12. While growing up: Were you physically punished in a way that resulted in bruises, burns, cuts, or broken bones?
[ ] Never [ ] Once [ ] Twice [ ] 3 Times [ ] 4 Times
[ ] 5 Times [ ] More than 5 Times [ ] Prefer not to Respond

If this happened:
12a. Did you experience intense fear, helplessness, or horror when it happened?
[ ] Yes [ ] No [ ] Prefer not to respond

13. While growing up: Did you see or hear family violence? (such as your father hitting your mother, or any family member beating up or inflicting bruises, burns, or cuts on another family)
[ ] Never [ ] Once [ ] Twice [ ] 3 Times [ ] 4 Times
[ ] 5 Times [ ] More than 5 Times [ ] Prefer not to Respond

If this happened:
13a. Did you experience intense fear, helplessness, or horror when it happened?
[ ] Yes [ ] No [ ] Prefer not to respond

14. Have you ever been slapped, punched, kicked, beaten up, or otherwise physically hurt by your spouse (or former spouse), a boyfriend or girlfriend, or some other intimate partner?
[ ] Never [ ] Once [ ] Twice [ ] 3 Times [ ] 4 Times
[ ] 5 Times [ ] More than 5 Times [ ] Prefer not to Respond

If this happened:
14a. Did you experience intense fear, helplessness, or horror when it happened?
[ ] Yes [ ] No [ ] Prefer not to respond

14b. Were you seriously injured?
[ ] Yes [ ] No [ ] Prefer not to respond
14c. Has more than one intimate partner physically hurt you?
[ ] Yes [ ] No [ ] Prefer not to respond

14d. If yes, how many hurt you? ________________ [ ] Prefer not to respond
15. **Before your 13th birthday:** Did anyone who was at least 5 years older than you touch or fondle your body in a sexual way or make you touch or fondle his or her body in a sexual way?

   [  ] Never  [  ] Once  [  ] Twice  [  ] 3 Times  [  ] 4 Times  
   [  ] 5 Times  [  ] More than 5 Times  [  ] Prefer not to Respond

15a. A stranger?  [  ] Yes  [  ] No  [  ] Prefer not to respond

15b. A friend or acquaintance?  [  ] Yes  [  ] No  [  ] Prefer not to respond

15c. A parent or caregiver?  [  ] Yes  [  ] No  [  ] Prefer not to respond

15d. A relative?  [  ] Yes  [  ] No  [  ] Prefer not to respond

15e. Were there threats or force used?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

15f. Were you seriously injured?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

15g. Were there oral, anal, or vaginal penetration?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

*If this happened:*

15h. Did you experience intense fear, helplessness, or horror when it happened?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

16. **Before your 13th birthday:** Did anyone close to your age touch sexual parts of your body or make you touch sexual parts of their body against your will or without your consent?

   [  ] Never  [  ] Once  [  ] Twice  [  ] 3 Times  [  ] 4 Times  
   [  ] 5 Times  [  ] More than 5 Times  [  ] Prefer not to Respond

16a. A stranger?  [  ] Yes  [  ] No  [  ] Prefer not to respond

16b. A friend or acquaintance?  [  ] Yes  [  ] No  [  ] Prefer not to respond

16c. A relative?  [  ] Yes  [  ] No  [  ] Prefer not to respond

16d. Were there threats or force used?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

16e. Were you seriously injured?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

16f. Was there oral, anal, or vaginal penetration?
   [  ] Yes  [  ] No  [  ] Prefer not to respond

*If this happened:*

16g. Did you experience intense fear, helplessness or horror when it happened?
   [  ] Yes  [  ] No  [  ] Prefer not to respond
17. *After your 13th birthday and before your 18th birthday:* Did anyone touch sexual parts of your body or make you touch sexual parts of his or her body *against your will or without your consent*?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once</th>
<th>Twice</th>
<th>3 Times</th>
<th>4 Times</th>
<th>5 Times</th>
<th>More than 5 Times</th>
<th>Prefer not to Respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>17a. A <strong>stranger</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17b. A <strong>friend or acquaintance</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17c. A <strong>relative</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17d. An <strong>intimate partner</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17e. Were there threats or force used?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>
| 17f. Were you seriously injured?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>
| 17g. Was there oral, anal, or vaginal penetration?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>

*If this happened:*

17h. Did you experience intense fear, helplessness or horror when it happened?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>

18. *After your 18th birthday:* Did anyone touch sexual parts of your body or make you touch sexual parts of his or her body *against your will or without your consent*?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once</th>
<th>Twice</th>
<th>3 Times</th>
<th>4 Times</th>
<th>5 Times</th>
<th>More than 5 Times</th>
<th>Prefer not to Respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>18a. A <strong>stranger</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18b. A <strong>friend or acquaintance</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18c. A <strong>relative</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18d. An <strong>intimate partner</strong>?</td>
<td>[ ] Yes</td>
<td>[ ] No</td>
<td>[ ] Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18e. Were there threats or force used?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>
| 18f. Were you seriously injured?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>
| 18g. Was there oral, anal, or vaginal penetration?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>
If this happened:

18h. Did you experience intense fear, helplessness or horror when it happened?
[ ] Yes    [ ] No    [ ] Prefer not to respond

19. Were you ever subject to uninvited or unwanted sexual attention? (other than sexual contact covered by Items 15, 16, 17, and 18; examples: touching, cornering, pressure for sexual favors, verbal remarks)
[ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
[ ] 5 Times    [ ] More than 5 Times    [ ] Prefer not to Respond

19a. A stranger?
[ ] Yes    [ ] No    [ ] Prefer not to respond

19b. A friend or acquaintance?
[ ] Yes    [ ] No    [ ] Prefer not to respond

19c. A relative?
[ ] Yes    [ ] No    [ ] Prefer not to respond

19d. A supervisor or coworker?
[ ] Yes    [ ] No    [ ] Prefer not to respond

If this happened:

19e. Did you experience intense fear, helplessness or horror when it happened?
[ ] Yes    [ ] No    [ ] Prefer not to respond

20. Has anyone stalked you (in other words, followed you or kept track of your activities), causing you to feel intimidated or concerned for your safety?
[ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
[ ] 5 Times    [ ] More than 5 Times    [ ] Prefer not to Respond

20a. A stranger?
[ ] Yes    [ ] No    [ ] Prefer not to respond

20b. A friend or acquaintance?
[ ] Yes    [ ] No    [ ] Prefer not to respond

20c. A relative?
[ ] Yes    [ ] No    [ ] Prefer not to respond

20d. An intimate partner?
[ ] Yes    [ ] No    [ ] Prefer not to respond

If this happened:

20e. Did you experience intense fear, helplessness or horror when it happened?
[ ] Yes    [ ] No    [ ] Prefer not to respond

21. Have you or an intimate partner ever had a miscarriage?
[ ] Never    [ ] Once    [ ] Twice    [ ] 3 Times    [ ] 4 Times
[ ] 5 Times    [ ] More than 5 Times    [ ] Prefer not to Respond

If this happened:

21a. Did you experience intense fear, helplessness or horror when it happened?
[ ] Yes    [ ] No    [ ] Prefer not to respond

21b. Did it (ever) happen after you were physically injured?
[ ] Yes    [ ] No    [ ] Prefer not to respond
22. Have you or an intimate partner ever had an abortion?
   [ ] Never   [ ] Once   [ ] Twice   [ ] 3 Times   [ ] 4 Times
   [ ] 5 Times   [ ] More than 5 Times   [ ] Prefer not to Respond

If this happened:
   22a. Did you experience intense fear, helplessness or horror when it happened?
       [ ] Yes   [ ] No   [ ] Prefer not to respond

23. Have you experienced (or seen) any other events that were life threatening, caused serious
    injury, or were highly disturbing or distressing? (examples: lost in the wilderness, a serious
    animal bite, violent death of a pet, being kidnapped or held hostage, seeing a mutilated body or
    body parts)
   [ ] Never   [ ] Once   [ ] Twice   [ ] 3 Times   [ ] 4 Times
   [ ] 5 Times   [ ] More than 5 Times   [ ] Prefer not to Respond

Please describe: ____________________________________________________________

If this happened:
   23a. Did you experience intense fear, helplessness or horror when it happened?
       [ ] Yes   [ ] No   [ ] Prefer not to respond

   23b. Were you seriously injured?
       [ ] Yes   [ ] No   [ ] Prefer not to respond

24. The events listed below correspond to items 1 to 23 on this questionnaire. If any of these
    events happened to you, select the one event that causes you the most distress. Make sure you
    click only one number.

   [ ] Natural disaster
   [ ] Motor vehicle accident
   [ ] “Other” kind of accident
   [ ] Warfare or combat
   [ ] Sudden death of a close friend
   [ ] Life-threatening or disabling event experienced by a loved one
   [ ] Life-threatening illness
   [ ] Robbery/weapon used
   [ ] Assaulted by an acquaintance
   [ ] Witnessed severe assault of an acquaintance or a stranger
   [ ] Threatened with death or serious harm

   [ ] Growing up: was physically punished
   [ ] Growing up: witnessed family violence
   [ ] Physically hurt by intimate partner
   [ ] Before 13: unwanted sexual contact
   [ ] Before 13: unwanted sexual contact with someone at least 5 years older
   [ ] As a teen: unwanted sexual contact
   [ ] As an adult: unwanted sexual contact
   [ ] Sexual harassment
   [ ] Stalked
   [ ] Miscarriage
   [ ] Abortion
   [ ] Some “other” traumatic event
   [ ] None of these events happened to me
24a. When did this event first occur? (your age or date) ______________________

24b. When did this event last occur? (try to be precise; e.g., year, month, day) ________

24c. How much distress (anxiety, worry, sadness, frustration, or grief) does this cause you? (check the best answer)

[ ] None happened to me [ ] Moderate distress
[ ] No distress [ ] Considerable distress
[ ] Slight distress [ ] Extreme distress
APPENDIX E

CENTRALITY OF EVENT SCALE (CES)
Please think back upon the most traumatic event in your life and answer the following questions in an honest and sincere way, by selecting a number from 1 to 5.

<table>
<thead>
<tr>
<th>Total Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Totally Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This event has become a reference point for the way I understand new experiences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>2. I automatically see connections and similarities between this event and experiences in my present life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3. I feel that this has become part of my identity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4. This event can be seen as a symbol or mark of important themes in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5. This event is making my life different from the life of most other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6. This event has become a reference point for the way I understand myself and the world.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>7. I believe that people who haven’t experienced this type of event think differently than I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>8. This event tells a lot about who I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>9. I often see connections and similarities between this event and my current relationships with other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10. I feel that this event has become a central part of my life story.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>11. I believe that people who haven’t experienced this type of event, have a different way of looking upon themselves than I have.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>12. This event has colored the way I think and feel about other experiences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>13. This event has become a reference point for the way I look upon my future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>14. If I were to weave a carpet of my life, this event would be in the middle with threads going out to many other experiences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>15. My life story can be divided into two main chapters: one is before and one is after this event happened.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>16. This event permanently changed my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>17. I often think about the effects this event will have on my future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>18. This event was a turning point in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>19. If this event had not happened to me, I would be a different person today.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>20. When I reflect upon my future, I often think back to this event.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX F

PTSD COGNITION INVENTORY (PTCI)
We are interested in the kind of thoughts which you may have had after a traumatic experience. Below are a number of statements that may or may not be representative of your thinking. Please read each statement carefully and tell us how much you agree or disagree with each statement. People react to traumatic events in many different ways. There are no right or wrong answers to these statements.

1 = Totally disagree  
2 = Disagree very much  
3 = Disagree slightly  
4 = Neutral  
5 = Agree slightly  
6 = Agree very much  
7 = Totally agree

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The event happened because of the way I acted.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>I can't trust that I will do the right thing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>I am a weak person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>I will not be able to control my anger and will do something terrible.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>I can't deal with even the slightest upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>I used to be a happy person but now I am always miserable.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>People can't be trusted.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>I have to be on guard all the time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>I feel dead inside.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>You can never know who will harm you.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11</td>
<td>I have to be especially careful because you never know what can happen next.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>12</td>
<td>I am inadequate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>13</td>
<td>I will not be able to control my emotions, and something terrible will happen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>If I think about the event, I will not be able to handle it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>The event happened to me because of the sort of person I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>16</td>
<td>My reactions since the event mean that I am going crazy.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>17</td>
<td>I will never be able to feel normal emotions again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>18</td>
<td>The world is a dangerous place.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>19</td>
<td>Somebody else would have stopped the event from happening.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>20</td>
<td>I have permanently changed for the worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>21</td>
<td>I feel like an object, not like a person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>22</td>
<td>Somebody else would not have gotten into this situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>23</td>
<td>I can't rely on other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>24</td>
<td>I feel isolated and set apart from others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>25</td>
<td>I have no future.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>26</td>
<td>I can't stop bad things from happening to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>27</td>
<td>People are not what they seem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>28</td>
<td>My life has been destroyed by the trauma.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>29</td>
<td>There is something wrong with me as a person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>30</td>
<td>My reactions since the event show that I am a lousy coper.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>31</td>
<td>There is something about me that made the event happen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. I will not be able to tolerate my thoughts about the event and I will fall apart.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>33. I feel like I don’t know myself anymore.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>34. You never know when something terrible will happen.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>35. I can’t rely on myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>36. Nothing good can happen to me anymore.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G

PTSD CHECKLIST FOR DSM-5 (PCL-5)
Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then circle one of the numbers to indicate how much you have been bothered by that problem in the past month.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all</th>
<th>A little bit</th>
<th>Moderately</th>
<th>Quite a bit</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Repeated, disturbing, and unwanted memories of the stressful experience</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Repeated, disturbing dreams of the stressful experience</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Feeling very upset when something reminded you of the stressful experience</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Avoiding memories, thoughts, or feelings related to the stressful Experience</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. Trouble remembering important parts of the stressful experience</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Blaming yourself or someone else for the stressful experience or what happened after it</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. Having strong negative feelings such as fear, horror, anger, guilt, or shame</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. Loss of interest in activities that you used to enjoy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. Feeling distant or cut off from other people</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. Irritable behavior, angry outbursts, or acting aggressively</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. Taking too many risks or doing things that could cause you harm</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. Being “superalert” or watchful or on guard</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. Feeling jumpy or easily startled</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. Having difficulty concentrating</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. Trouble falling or staying asleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX H

EMOTIONAL SUPPRESSION QUESTIONNAIRE
INSTRUCTIONS: Read each item and then circle the response that best describes your experience.

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Somewhat disagree</th>
<th>Neither agree nor disagree</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. From the beginning of the writing exercise, I thought about grammar, sentence construction, and how to write well.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. When I noticed myself starting to feel negative feelings, I tried not to feel that way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I felt negative feelings but I tried to hide it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I let myself experience my distressing thoughts. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. To keep myself from feeling anything, I prepared myself by focusing on the fact that it was part of a research project.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I tried to suppress any upsetting thoughts that came up.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I stopped or inhibited the natural expression of my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. When I started to feel upset, I relaxed and let myself experience those feelings. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I tried to think about what I was doing in a way that would keep me from feeling upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I pushed away upsetting thoughts and feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I tried not to show that I was feeling upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I let myself feel my feelings. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I approached the exercise intellectually and didn't focus on the upsetting nature of the experience.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. If I noticed upsetting thoughts or feelings, I shut out those thoughts.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Strongly disagree</td>
<td>Somewhat disagree</td>
<td>Neither agree nor disagree</td>
<td>Somewhat agree</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>---</td>
<td>------------------</td>
<td>------------------</td>
<td>-----------------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>15. I tried to act so that others would not know how upset I was feeling.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. I noticed my thoughts and feelings without reacting to them or resisting them. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. I kept myself in an objective frame of mind</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. I pushed away and blocked out any upsetting thoughts as they started.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19. I hid my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20. I accepted my thoughts and feelings, and let them pass. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

(R) = reverse coded.
APPENDIX I

REACTIONS TO RESEARCH PARTICIPATION QUESTIONNAIRE-REVISED (RRPQ-R)
We want to know your opinions about what it was like *for you* to be in this study. Your answers will help us understand how individuals feel about being in studies like this one. We *really* want to hear your opinions, even if there were things you did not like.

For each item below, please indicate the degree to which each statement is true for you. There are no right or wrong answers.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neither agree nor disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
<th>Prefer not to respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>I gained something positive from participating</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Knowing what I know now, I would participate in this study again if given the opportunity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>The research raised emotional issues for me that I had not expected. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I gained insight about my experiences through research participation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>The research made me think about things I didn’t want to think about. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I found the questions too personal. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I found participating in this study personally meaningful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I believe this study’s results will be useful to others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I trust that my replies will be kept private.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I experienced intense emotions during the research session. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I think this research is for a good cause.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I was treated with respect and dignity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I understood the consent form.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Statement</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>I found participating beneficial to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I was glad to be asked to participate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I like the idea that I contributed to science. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I was emotional during the research sessions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I felt I could stop participating at any time. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>I found participating in this study boring. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>The study procedures took too long. (R)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Participating in this study was inconvenient for me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Had I known in advance what participating would be like I still would have agreed to participate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Participation was a choice I freely made.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
APPENDIX J

DEBRIEFING FORM (LABORATORY SESSIONS)
Thank you for your participation in the session today. If you recall, this experiment consists of 3 in-person sessions followed by an online follow-up survey administered three weeks later.

In order to test our research questions, we need to compare people at multiple points in time. Studies that survey the same people at different time points are more difficult to conduct than single time point studies, but they allow researchers to better answer the types of questions that can be used to develop treatments and interventions that improve the well-being and functioning of people in society.

There is a chance that the material you dealt with today may have elicited some distressing thoughts, feelings, or memories for you. Talking with others or with a counselor can be helpful in handling with these upsetting feelings. Please refer to the attached list of local counseling agencies and community services if you need additional resources. If you need immediate assistance, please call the 24-hour Crisis Line (815) 758-6655. The experimenter, Derrecka Boykin, is also available during standard business hours to address any concerns.

If you have any questions concerning the experiment or would like to speak with the experimenters about the topics addressed in the present study, please contact Derrecka Boykin (dbutler1@niu.edu), Department of Psychology, Northern Illinois University, at (630) 755-5056, or Dr. Holly Orcutt, Department of Psychology, Northern Illinois University, at (815) 753-0372 during standard business hours.

Thank you for participating in the present study. The information you provided, once combined with information from other participants, will provide a better understanding of the impact of writing on psychological and physical functioning.

A list of agencies in the area that offer individual and group counseling for students and community members is attached.
Counseling Resources in DeKalb

DeKalb and Northern Illinois University are fortunate in having several free or low-cost services available to the community.

Student health insurance will cover 80% of eligible charges (after the deductible has been met) up to a maximum benefit of $2,500 per plan year for outpatient treatment. The counselor must be licensed in the State of Illinois to provide mental health services (e.g. psychologist, psychiatrist, licensed clinical social worker, licensed clinical professional counselor, marriage and family therapist, etc.)

This list is intended to help you find timely and appropriate assistance. Sometimes one agency will have a high demand for services that necessitates a waiting period for new clients, or you may have personal reasons for choosing one agency over another. Counselors at any of these agencies will gladly assist you in making a final decision about where to seek help.

Campus Services

Counseling and Student Development Center, NIU (STUDENTS ONLY)
Phone: 815/753-1206
Address: Campus Life Building-200
Fees: None for counseling. Modest testing fees.
Hours: 8:00 a.m. – 4:30 p.m. Monday-Friday
Open whenever NIU is open, including breaks.
After Hours: Assistance after hours available by calling—(815) 753-1212

Description of Services: This service provides students with short-term, individual and group counseling for a broad range of personal concerns. Career counseling services include interest assessment, workshops, and use of computerized career counseling programs. Educational counseling services include assistance with test anxiety and study skills. Assessments of drug and alcohol abuse are also provided. First appointment scheduled with 3-7 days. (Handicapped Accessible).

Counseling Laboratory, NIU
Phone: 815/753-9312
Address: 416 Graham Hall
Fees: None for students, faculty, or staff.
Hours: Call for available counseling hours.

Description of Services: A wide range of services are offered by the counselors including both personal and vocational counseling. In general, the approach used is one that promotes growth and focuses on increasing emotional well-being and self-awareness. All counselors are doctoral or masters level students who are being supervised by members of the counseling faculty. First appointments scheduled within 3-5 days.
Family Center, NIU
Phone: 815/753-1684
Address: 429 Garden, Rd
Fees: $5.00 per session fee for students. Faculty, staff, and community members charged on a sliding scale. No one will be denied services due to inability to pay.
Hours: Wednesday – 2:00 p.m. – 10:00 p.m. Thursday – 10:00 a.m. – 10:00 p.m. By appointment Monday through Friday. Open whenever NIU is open, including breaks.

Description of Services: Individual, couple, and family counseling. Services provided by graduate students under supervision of Marriage and Family Therapy faculty. First appointment scheduled within 4 days.

Psychological Services Center, NIU
Phone: 815/753-0591
Address: Normal Rd and Lincoln Hwy.
Fees: No fee for students. Faculty, staff, and community members charged on a sliding scale
Hours: Monday – 9:00 a.m. to 5:00 p.m. Tuesday – 11:00 a.m. – 7:00 p.m.
Wednesday-Friday- 9:00 a.m. to 5:00 p.m. Open whenever NIU is open, including breaks.

Description of Services: Individual, couples, family, and group psychotherapy, Intellectual, personality, and academic assessments. Clients are generally seen by advanced level graduate student staff under faculty supervision. Services tailored to meet a client’s specific needs. First appointment scheduled with 7 days. (Handicapped accessible.)

University Resources for Women
Phone: 815/753-0320
Address: 105 Normal Rd.
Fees: No fee for students, faculty or staff.
Hours: Monday-Friday- 8:00 a.m. – 4:30 p.m. Evening hours by appointment. Open whenever NIU is open including breaks.

Description of Services: Short-term counseling to individuals about their academic progress, careers, personal development, and other special concerns. Offered also are support groups, information and referral, issues regarding workplace disputes, and issues involving sexual harassment. (The facility is handicapped accessible).

Community Resources

Ben Gordon Community Mental Health Center
Phone: 815/756-4875
Address: 12 Health Services Dr.-DeKalb
Hours: Monday-Thursday- 8:00 a.m. – 8:30 p.m.
Friday-8:00 a.m.-5:00 p.m.
After Hours: 815/758-6655 Crisis Line

Description of Services: Comprehensive counseling services to all residents of DeKalb County. Services to all persons affected by mental health problems, substance abuse, and family/child welfare concerns. 24-hour sexual assault/abuse services can be accessed through the Crisis Line. First appointment scheduled within 30 days. (Handicapped accessible and on Campus Bus Route).

**Family Service Agency, Center for Counseling**  
Phone: 815/758-8636  
Address: 14 Health Services Dr.-DeKalb  
Fees: $75.00 per visit. Insurance accepted, including NIU Student Insurance. Payment plans and scholarship funds available.  
Hours: Monday-Wednesday-9:00 a.m. – 8:00 p.m.  
Thursday – Friday – 8:00 a.m. – 4:00 p.m. Additional hours available by appointment.

Description of Services: Individual, couple, group counseling for children, adults, senior citizens, and families. First appointment scheduled within 1-7 days. (Handicapped accessible and on Campus Bus Route).

***Private counselors, clinical social workers, and psychologists are available in the yellow pages of the phone book under “Psychologist” or “Mental Health Services” or “Social Services”.*
APPENDIX K

INFORMED CONSENT (FOLLOW-UP ASSESSMENT)
I agree to participate in the research project entitled “The Impact of Writing on Health Functioning” being conducted by Derrecka Boykin, a graduate student at Northern Illinois University. I have been informed that the purpose of this study is to understand how writing impacts psychological and physical well-being.

I understand that if I agree to participate in this study, I will be asked to complete several questionnaires concerning my current mental and physical health, mood, exposure to stressful life events, coping strategies, and reactions to research participation. My participation in this study will contribute to our understanding of adaptive coping methods for stress and will assist in the development of intervention programs. This study will last approximately 30 minutes. Upon completion of this study, I am informed that I will receive 1 experimental points toward partial course credit in Introduction to Psychology (PSCY 102). I understand that I will receive one draw in a drawing for three $25 awards for completing the survey.

I understand that any information gathered during this research study is intended to be used for research purposes only and I understand that the researcher, for the purposes of this research, does not have authority to address, or a duty to report, sexual violence, misconduct or harassment. If I wish to report an instance of sexual violence, misconduct or harassment, I understand that I need to contact the University’s Title IX Coordinator, Karen L. Baker, at 815-753-6017 or kbaker@niu.edu, or visit the University’s Title IX website at http://www.niu.edu/sexualmisconduct/help/report.shtml for other reporting options.

I understand that all information gathered during this experiment will be kept in the strictest confidence and will not be available to anyone other than the experimenters conducting the study. I am aware that all information gathered will be kept in password-protected, encrypted electronic files that will be stored on computers locked in a secure location. However, my confidentiality will be maintained to the degree permitted by the technology used. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

I understand that potential risks for participating include experiencing distressing thoughts and feelings in response to study materials related to trauma history and/or mental health. If I become distressed, I know that I can contact the 24-hour Crisis Line at (815) 758-6655 at any time. I understand that I will receive an additional list of numbers to local counseling resources should I need to further process any upsetting feelings or thoughts that arise from participating in this study.

I also understand that my participation is voluntary and I may withdraw at any time without penalty or prejudice. I know that if I have any additional questions concerning this study, I may contact Derrecka Boykin at (630) 755-5056 or Dr. Holly Orcutt, Graduate Advisor, Department of Psychology, Northern Illinois University, at (815) 753-5920 during standard business hours.

I realize that my consent to participate in this project does not constitute a waiver of any legal actions or redress I might have as a result of my participation. If I wish to have further information regarding my rights as a research subject, I may contact the Office of Research and Compliance (ORC) at Northern Illinois University at (815) 753-8588 or visit their website at www.orci.niu.edu/orci.
By clicking on the appropriate buttons below, I am stating that I have read the consent form in its entirety and understand the purpose and conditions of the study.

[ ] I agree to participate in the present study
[ ] I do not wish to participate in the present study
APPENDIX L

DEBRIEFING FORM (FOLLOW-UP ASSESSMENT)
Thank you for participating in the present study. The information you provided, once combined with information from other participants, will provide a better understanding of the impact of writing on psychological and physical well-being.

It is possible that the material you dealt with today may have elicited some distressing thoughts, feelings, or memories for you. Talking with others or with a counselor can be helpful in handling with these upsetting feelings. Please refer to the attached list of local counseling agencies and community services if you need additional resources. If you need immediate assistance, please call the 24-hour Crisis Line (815) 758-6655. The experimenter, Derrecka Boykin, is also available during standard business hours to address any concerns.

If you have any questions concerning the experiment or would like to speak with the experimenters about the topics addressed in the present study, please contact Derrecka Boykin (dbutler1@niu.edu), Department of Psychology, Northern Illinois University, at (630) 755-5056, or Dr. Holly Orcutt, Department of Psychology, Northern Illinois University, at (815) 753-5920 during standard business hours.

Thank you again for your participation!

The link below includes a list of agencies in the area that offer individual and group counseling for students and community members:

http://www.orci.niu.edu/orci/human_research/applications/counseling_resources.pdf