THE THERAPEUTIC BENEFIT OF EXPRESSIVE WRITING FOR POSTTRAUMATIC SYMPTOMS: A RANDOMIZED CONTROLLED TRIAL OF EMOTIONAL MODERATORS AND WRITING MODALITY

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Christina Alexandra D’Ambrosio, candidate for the degree of Master of Arts in Clinical Psychology, has presented a thesis titled, *The Therapeutic Benefit of Expressive Writing for Posttraumatic Symptoms: A Randomized Controlled Trial of Emotional Moderators and Writing Modality*, in an oral examination held on June 17, 2016. The following committee members have found the thesis acceptable in form and content, and that the candidate demonstrated satisfactory knowledge of the subject material.

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Abstract

Expressive writing is a therapeutic intervention requiring individuals to write about distressing events and their emotional responses to these experiences (Pennebaker & Beall, 1986). The use of expressive writing has improved behavioural, physiological, and psychological outcomes in many populations, including individuals with posttraumatic stress disorder (PTSD; Baikie & Wilhelm, 2005). Greater self-disclosure on such writing tasks has been associated with higher perceived benefits and helpfulness (Brewin & Lennard, 1999). Researchers have investigated how expressive writing protocols can be utilized online to increase levels of self-disclosure when writing about traumatic experiences and, consequently, improve PTSD symptom outcomes. Researchers have not yet assessed for modality-based differences (e.g., typed vs. hand-written expressive writing) for therapeutic efficacy or emotional engagement. The present investigation examined whether 1) typed and hand-written expressive writing equally reduced PTSD symptoms; and 2) emotional engagement affected the efficacy of expressive writing in reducing PTSD symptoms. A community and student sample (n = 29) with clinically significant PTSD symptoms completed the trial. Participants were randomized to one of four conditions with different writing modalities (i.e., typed or hand-written) and paradigms (i.e., control or expressive writing). In one session, participants were administered three 15-minute writing tasks and self-report questionnaires evaluating aspects of emotion (i.e., recognition, expression, trait negative emotionality) and PTSD symptom severity. An optional 7-day follow-up questionnaire re-evaluating PTSD symptom severity was also administered to participants. Each experimental group had non-significant decreases in PTSD symptoms from pre- to post-intervention, these changes being dependant on pre-intervention symptom severity; however, alexithymia,

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dissociation (i.e., attentional dissociation and dissociative amnesia), negative affect, emotional approach coping, and the presence of a learning disability did affect symptom changes, and when these factors were considered the experimental conditions significantly differed in their effect on symptom outcomes. In conclusion, findings of the current trial suggest that a day-intensive session of expressive writing neither reduces PTSD symptoms nor differs in efficacy based on its method of completion unless emotional engagement with the task is considered. Further investigation into how learning disabilities and emotional predispositions affect engagement with expressive writing is warranted to clarify its efficacy in clinical PTSD populations.
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Dedication

To my late Baba, who taught me about admirably persevering in times of adversity. To David, who inspires me to challenge myself each and every day. To my family and cohort, whose companionship and unwavering encouragement and support are invaluable.
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1. Introduction

1.1 Overview

Expressing personal narratives is an effective means of helping people overcome negative emotional reactions associated with difficult life events (White & Epston, 1990). Expressive writing (EW) is a therapeutic intervention requiring individuals to write about distressing or traumatic events and their emotional responses to these experiences. EW is similar to exposure therapy, a leading treatment for reducing posttraumatic stress disorder (PTSD) symptoms (Monson, Resnick, & Rizvi, 2014). Nevertheless, evidence supporting the effectiveness of EW for reducing PTSD symptoms is equivocal (Fratta, 2006; Sayer et al., 2015) and the mechanisms underlying its effects is uncertain. Conflicting results from EW efficacy research for PTSD symptoms may be attributed to variations in administration (Nazarian & Smyth, 2010). Conflicting results regarding EW efficacy may also be due to the degree of engagement during this type of emotional disclosure, as greater emotional engagement is associated with greater subjective gains from completing EW (Brewin & Lennard, 1999). Emotional engagement with EW may be affected by individual use and experience of emotions; for example, individual emotional expressiveness during emotional disclosures (Lu & Stanton, 2009; Niles, Haltom, Mulvenna, Liberman, & Stanton, 2014), recognition of emotions (Páez, Velasco, & González, 1999), levels of trait negative emotion (Hoyt & Yeater, 2011), and symptom severity (Smyth, Hockemeyer, & Tulloch, 2008).

Researchers have examined whether EW protocols can be administered through online networks using computer-based communication (i.e., typing; Corter & Petrie, 2008; Hirai et al., 2012). Computer-based communication was found to increase levels of
self-disclosure (Joinson, 2001). Relatively reduced self-disclosure during EW has been associated with greater psychological symptoms after the task (Pachankis & Goldfried, 2010); therefore, writing methods that increase self-disclosure, such as computer-based communication, may improve EW efficacy. Potential differences between typed and hand-written EW modalities for treating PTSD symptoms have not been assessed. Further, the impact of typed or hand-written disclosure modalities on emotional engagement during an EW task has not been explored in a PTSD sample. The current thesis includes a detailed description of EW and previously related research. In particular, the thesis details previous research on EW and PTSD symptoms, mechanisms that may influence emotional engagement during EW, and the use of EW with online treatment platforms. Finally, an overview of the purpose, hypotheses, methodology, results, implications, and limitations of the current investigation is presented.

1.2 EW

EW is a psychosocial intervention requiring individuals to write about previous experiential events and associated emotional responses (Hirai, Skidmore, Clum, & Dolma, 2012; Nazarian & Smyth, 2013; Pennebaker & Beall, 1986). An autobiographical retelling of events may facilitate the organization and coherence of meaningful events and, therein, help an individual comprehend their own actions and resulting consequences (Chase, 2005). Individuals who have performed therapeutic writing tasks, such as EW, describe the activity as an opportunity to confront stressors, use problem-solving strategies, manage emotions, re-evaluate perspectives, and engage in self-development (Hudson & Day, 2012). Empirical results suggest telling personal narratives through EW
reduces distress and improves health (Klein & Boals, 2001; Pennebaker, Mayne, & Francis, 1997); but, the mechanisms producing such benefits are poorly understood.

Pennebaker and Beall (1986) initially introduced EW. The researchers asked individuals to write about one or more upsetting or traumatic experience(s) and describe their feelings about the event(s) for 15 minutes each day over four consecutive days. Individuals completing EW had short-term increases in physiological arousal and negative moods, but decreases in health care visits six months later (Pennebaker & Beall, 1986). EW was then thought to promote emotional disclosure of stressful or traumatic events in a structured and confidential manner, and foster emotional expression and processing (Smyth, 1998). Various iterations of EW have since been studied to determine the most efficacious form of administration (Smyth & Pennebaker, 2008). Most procedures require participants to write a narrative for 10 to 30 minutes, two to five times per day, for several days or weeks (Baikie & Wilhelm, 2005; Bond & Pennebaker, 2012; Nazarian & Smyth, 2013; Pennebaker et al., 1997). A meta-analysis, which was used to assess the effects of EW in healthy participants ($n = 806$) across 19 studies, evidenced self-reported health (e.g., health centre visits) and general functioning (e.g., absenteeism) as improved if people had days without writing in-between writing sessions (Smyth, 1998). Student participants ($n = 106$) that used EW to write about a personal life transition on three occasions within a single hour also benefitted from the procedure, reporting reductions in general physical health symptoms (Chung & Pennebaker, 2008). A meta-analysis of 146 studies ($n = 10,994$) examining the effect of EW on physiological (e.g., blood lipids), health (e.g., general physical symptoms), and psychological (e.g., perceived stress) outcomes in addition to the subjective impact of the intervention (e.g.,
positive attitude about intervention effect) evidenced significant improvements when participants performed EW at least three times for 15 minutes (Frattaroli, 2006). Overall, the current results suggest participants perceive fewer benefits if writing only occurs on one occasion (Chung & Pennebaker, 2008).

EW has been used in over 400 investigations examining various physical and psychological outcomes (Niles et al., 2014) and has typically produced small to moderate effects in trials (i.e., Cohen’s $d = 0.15$ to 0.47; Frattaroli, 2006; Smyth, 1998). Results from two meta-analyses (Frisina, Borod, & Lepore, 2004; Smyth, 1998) provided evidence to support EW as improving physical (e.g., general health symptoms) and behavioural (e.g., healthcare utilization) outcomes in healthy individuals and those with physical (e.g., renal cancer) or psychiatric (e.g., PTSD) disorders; however, other researchers have not identified benefits in similar populations (Frattaroli, 2006; Mogk, Otte, Reinhold-Hurley, & Kröner-Herwig, 2006). Results regarding the therapeutic utility of EW for psychological health have also been discrepant (Baikie & Wilhelm, 2005; Sloan, Marx, Epstein, & Lexington, 2007). Researchers have found EW has long-term (i.e., at least four-week post-intervention) benefits on psychological health, such as posttraumatic symptoms in students ($n = 183$) who have experienced traumatic events (Hirai et al., 2012), anger and distress in war veterans ($n = 1,292$) with self-reported reintegration difficulty (Sayer et al., 2015), depressive and posttraumatic symptoms in women ($n = 113$) after childbirth (Di Blasio et al., 2015), and mood and posttraumatic growth in individuals ($n = 25$) diagnosed with PTSD (Smyth et al., 2008). A meta-analysis by Frattaroli (2006) found that EW significantly improved distress, depression, and positive functioning in student and clinical samples ($n = 10,994$). The Frattaroli
(2006) results contrast with a meta-analysis of 19 randomized controlled trials using student and clinical samples \((n = 1,496)\), which found EW does not have long-term benefits on psychological health measures, such as depression, anxiety, and PTSD symptoms (Mogk et al., 2006). Despite the considerable amount of research that has used the EW procedure, more research examining its effect on specific populations needs to be conducted to comprehend the discrepant findings.

1.3 PTSD and EW

PTSD is a psychological disorder characterized in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*) by symptoms of intrusions, avoidance, negative mood and cognitions, and hyperarousal and reactivity after exposure to a traumatic event that distresses or impairs individual functioning for over one month (American Psychological Association [APA], 2013). PTSD is marked by maladaptive emotional and/or cognitive processing of a traumatic event (Monson et al., 2014). Numerous empirically validated etiological models have been used to describe the development and maintenance of PTSD (for a review see Taylor, 2006); however, two cognitive-behavioural models may help to explain the mechanism(s) of action when EW is performed.

The emotional processing model (Foa & Kozak, 1986; Foa, Steketee, & Rothbaum, 1989; Foa & Rothbaum, 1998) proposes that PTSD develops due to a fear structure being stored in memory after a traumatic event. The described fear structure holds representations of feared stimuli, response formation, and meaning information. When an individual encounters stimuli interpreted to be similar to a traumatic event, the fear network becomes activated. According to Foa and colleagues, attempts to avoid this
activation are comprised of active (e.g., physically avoiding external triggers of trauma) and passive (e.g., emotional numbness) avoidance behaviour. The cognitive model of PTSD (Ehlers & Clark, 2000) suggests that when a traumatic event occurs an individual processes the sensory experience rather than conceptualizing the experience and integrating it with their worldview. When sensations resembling the traumatic event are experienced associations are made to the trauma, causing an individual with PTSD to perceive a current and serious threat (i.e., re-experiencing a traumatic event). An individual with PTSD may then develop a perceived inability to competently deal with reminders of trauma and, consequently, may avoid trauma cues. Avoiding trauma cues prevents an individual from challenging appraisals of their competency and the development of adaptive coping strategies. The emotional processing and cognitive models both stipulate that maladaptive processing of trauma may result in avoidance of trauma-related stimuli as a means to prevent re-traumatization.

Exposure therapy is one of the leading empirically-supported treatments for PTSD, whereby trauma-related cues are repeatedly re-experienced through in vivo and imaginal exposures (Monson et al., 2014; Taylor, 2006). In vivo exposure involves direct exposure to feared situations, whereas imaginal exposure requires an individual to imagine being in a fear-inducing situation (Monson et al., 2014). By repeatedly exposing an individual to fear-inducing, trauma-related stimuli, he or she becomes desensitized and habituates to those stimuli, having less fear and anxiety when the stimuli are present. EW resembles imaginal exposure (Sloan, Marx, & Epstein, 2005; Sloan et al., 2007) by requiring the emotional disclosure of a traumatic event; therefore, EW may promote
habituation to negative emotions associated with traumatic stimuli (Nazarian & Smyth, 2010).

Only seven publications have investigated the efficacy of EW on symptoms experienced by individuals who met, or were suspected to have met, diagnostic criteria for PTSD (Sloan, Sawyer, Lowmaster, Wernick, & Marx, 2015). Despite the limited literature, several studies have evidenced EW as an efficacious therapeutic technique for reducing posttraumatic symptoms in general (Di Blasio et al., 2003; Deters & Range, 2003; Hemenover, 2003; Hoyt & Yeater, 2011; Kenardy & Piercy, 2006; Klein & Boals, 2001; Sayer et al., 2015; Sloan & Marx, 2004; Sloan et al., 2005; Sloan et al., 2007), which may be due to similarities with exposure therapy. Progressive decreases in physiological and self-reported emotional arousal are associated with the repeated use of EW (Sloan & Marx, 2004; Sloan et al., 2005; Sloan et al., 2007). Reductions in heart rate reactivity, self-reported arousal, and salivary cortisol to traumatic experiences are also greater when EW is used for one event compared to multiple events in student populations (Guastella & Dadds, 2006; Sloan et al., 2005). As with the general EW results described above, the results have not been consistent; for example, several researchers have evidenced EW does not significantly reduce posttraumatic symptoms in student and clinical samples (Batten, Follette, Rasmussen-Hall, & Palm, 2002; Boals, Murrell, Berntsen, Southard-Dobbs, & Agtarap, 2015; Frattaroli, 2003; Frattaroli, 2006).

Researchers have also explored how other PTSD-related constructs may be influenced by EW. Smyth and colleagues’ (2008) results indicated EW enhances posttraumatic growth (i.e., the ability to perceive positive outcomes despite experiencing trauma), mood, and neuroendocrine responses to images of trauma-related memories and
reduces levels of anger and tension in participants \( (n = 25) \) who previously experienced trauma. Similarly, in a study comparing the efficacy of EW and a benign writing task in students \( (n = 50) \) who disclosed experiencing a distressing event, participants who completed EW for 20 minutes per day over three consecutive days had significant increases in levels of personal growth, mastery, and self-acceptance, and decreased levels of depression, interpersonal sensitivity, anxiety, and somatization compared to controls (Hemenover, 2003). Moreover, increases in posttraumatic growth can persist for up to eight weeks if EW is completed (Stockton, Joseph, & Hunt, 2014). Instead of impacting PTSD symptoms directly, EW may then impact other constructs related to psychological health that influence and maintain PTSD symptoms. The potential impact of EW on PTSD-related constructs may explain why studies solely examining symptom reduction may not always demonstrate clinical benefits. Researchers need to further explore what factors and mechanisms make EW an efficacious procedure for treating PTSD symptoms.

1.4 Emotional Engagement

The mechanisms that drive EW and make it efficacious in reducing PTSD symptoms remain unclear despite the large amount of EW research conducted to date. Researchers have investigated potential mechanisms that influence the efficacy of EW, particularly mechanisms that relate to the experience and use of emotions. In a study by Brewin and Lennard (1999) that examined affect in students \( (n = 80) \) disclosing a stressful event when EW and a benign writing task were administered, those who self-disclosed more personal information during EW had greater levels of negative affect after the writing task and found the task more helpful. The researchers suggested their results could be explained by the level of emotional involvement participants had during EW.
(Brewin & Lennard, 1999); therefore, individuals who have greater levels of self-disclosure with EW may be more emotionally engaged during this task. Emotional engagement with trauma is suspected to be essential for habituation to occur (Foa, 1997); as such, EW may be a catalyst for the emotional processing and habituation of trauma if there is emotional engagement with the task. Since an individual’s experience and utilization of emotions may impact his or her level of emotional engagement with EW, constructs that relate to the use or experience of emotions or suspected to affect emotional engagement with EW and its efficacy on PTSD symptoms were explored.

1.4.1 Emotional expression. Measures assessing emotional expression are often used in EW studies, as the treatment requires emotional disclosure. In a study assessing the effect of emotional expressiveness on EW efficacy for anxiety, depression, and general physical health symptoms in healthy participants \( n = 116 \), individuals with high expressivity had significantly greater reductions in anxiety compared to a control condition at 3-month follow-up (Niles et al., 2014). Higher levels of ambivalence over emotional expression, which suggests an individual has a greater tendency to be uncertain about expressing experienced emotions, is also associated with improvements following the completion of EW (Niles et al., 2014). In a study that examined the impact of different writing tasks in students \( n = 130 \) with depressive and general physical symptoms, individuals with greater ambivalence over emotional expression had larger reductions in negative affect after completing EW (Lu & Stanton, 2009). Both emotional expression and ambivalence over emotional expression appear to have benefits on psychological symptoms when EW is completed; however, whether such factors impact the effect of EW on PTSD symptoms is not yet known.
Another factor to consider is emotional approach coping—a construct pertaining to the active acknowledgment, exploration, and expression of emotion (Stanton et al., 2000)—which is a more inclusive concept relating to emotional expression. Individuals who utilize emotional coping strategies, regardless if they are ambivalent to emotional expression or not, may find EW an effective form of emotional disclosure compared to individuals with other coping approaches. Levels of emotional approach coping predict degrees of depressive symptoms, distress, and physical impairment (Berghuis & Stanton, 2002; Smith, Lumley, & Longo, 2002), which are constructs that have significantly declined in trials when EW was performed by student and clinical samples disclosing distressing events (Hemenover, 2003; Frattaroli, 2006; Sloan & Marx, 2004; Sloan et al., 2005; Sloan et al., 2007). Emotional approach coping may then affect the efficacy of EW by influencing an individual’s engagement during EW, regardless of their emotional expression during this task.

1.4.2 Trait negative emotionality. Levels of negative affect (i.e., an individual’s tendency to experience intense anxiety, hostility, self-consciousness, and/or impulsivity) contribute to the efficacy of EW in decreasing PTSD symptoms (Hoyt & Yeater, 2011). Researchers have found a strong positive correlation between negative affect and posttraumatic symptoms (Parslow, Jorm, & Christensen, 2006; Shapinsky, Rapport, Henderson, & Axelrod, 2005). The results were consistent with research by Hoyt and Yeater (2011), who found that when participants \((n = 120)\) were given 30-minute writing tasks for two days, those with high negative affect displayed greater symptoms of posttraumatic stress on both days regardless of their writing condition (i.e., EW vs. control). Moreover, only participants with high negative affect had significant declines in
PTSD symptoms when completing EW (Hoyt & Yeater, 2011), which suggests that individuals with greater negative affect may have higher levels of emotional engagement during EW. Simultaneous examination of trait negative emotionality and changes in PTSD symptoms when EW is utilized is still warranted to clarify whether the relationship between the variables exists when other emotional constructs are also examined.

1.4.3 Recognition of emotions. EW requires emotional disclosure; as such, difficulties recognizing emotions may compromise the efficaciousness of EW in terms of reducing PTSD symptoms. The current investigation focused on three constructs related to the recognition of emotions that have not been greatly explored in EW research: alexithymia, dissociation, and absorption.

Researchers have found PTSD symptom severity is positively related to alexithymia (Frewen, Pain, Dozois, & Lanius, 2006; McCaslin et al., 2006; Söndergaard & Theorell, 2004). Alexithymia is a condition where individuals experience difficulties identifying and labelling their emotions (Taylor, Bagby, & Parker, 1997), which can influence how an individual understands and expresses their emotions (Pluth, 2012; Taylor et al., 1997). There is evidence that individuals \( n = 88 \) with alexithymia have fewer illness-related visits to general practitioners if they complete EW instead of writing about neutral, fact-focused topics (Baikie & Mcllwain, 2008), and that individuals \( n = 51 \) with higher degrees of alexithymia have greater improvement in negative mood scores after completing EW (Páez et al., 1999). O’Connor and Ashley (2008) examined differences in blood pressure, general health symptoms, and emotional distress, when healthy students \( n = 87 \) with and without alexithymia emotionally disclosed a distressing event through EW. Neither group demonstrated any improvements, although
individuals with alexithymia who disclosed more negative than positive words during EW had reduced cardiovascular responses to stress two weeks later (O’Connor & Ashley, 2008). Accordingly, there is evidence that individuals with alexithymia can engage with EW in a manner that is beneficial; however, researchers should investigate whether this predisposition affects EW efficacy when PTSD is present.

Dissociation is a cognitive process whereby the integration of internal or external stimuli into consciousness is disrupted, resulting in these stimuli having discrepant manifestations in conscious awareness (Erdelyi, 1994; Nemiah, 1991; Putnam, 1989). This process occurs as attentional resources are increased amongst multiple stimuli, but are not unified, causing the absence of conscious attention to any one stimuli (Carleton, Abrams, & Asmundson, 2010). Dissociation is a response to trauma where individuals disengage from traumatic stimuli, thereby not being consciously aware of such stimuli, during a traumatic event or in response to reminders of a traumatic event (Briere, Scott, & Weathers, 2005; Feeny, Zoellner, Fitzgibbons, & Foa, 2000). Dissociation may be an avoidance coping mechanism (Ozer, Best, Lipsey, & Weiss, 2003) and a critical risk factor for the development of PTSD (Feeny et al., 2005). PTSD symptoms are also positively correlated with dissociation, potentially being an indicator of traumatic severity (Ozer et al., 2003). Indeed, posttraumatic symptoms in women (n = 58) who had recently experienced a mass shooting and completed EW were associated with self-reported state dissociation and avoided emotions during writing tasks (Reddy, Seligowski, Rabenhorst, & Orcutt, 2014). Conversely, absorption is a cognitive process whereby attentional resources are allocated to specific stimuli at the cost of excluding other, unrelated stimuli, and has been considered the opposite extreme of dissociation.
along an attentional processing continuum (Carleton et al., 2010). Absorption has been demonstrated to be higher in individuals who have experienced traumatic events compared to those who have not (Alper et al., 1997; Simeon, Giesbrecht, Knutelska, Smith, & Smith, 2009) and may be an avoidant coping technique due to certain stimuli receiving increased attention compared to other stimuli (Carleton et al., 2010). There is conflicting evidence whether attention bias towards threat following trauma predicts the presence of posttraumatic symptoms (Elsesser, Sartory, & Tackenberg, 2005; Naim et al., 2014). Greater degrees of dissociation and absorption may prevent individuals from comprehensively experiencing their emotions and, consequently, impact how symptoms are affected by the completion of EW. No research has assessed the effect of dissociation and absorption on EW treatment efficacy.

1.4.4 Symptom severity. Empirically-supported psychotherapies for PTSD can be distressing for individuals, whether a traumatic event is recalled or not (Stahl & Moore, 2013). Completing writing tasks about distressing and/or traumatic experiences through EW may also be difficult. In a trial investigating the efficacy of EW amongst other writing tasks on physical and depressive symptoms in a community sample (n = 288), researchers found that participants with higher levels of depression reported EW tasks were too distressing and expressed concern that the task may trigger another depressive episode (Baikie, Geerligs, & Wilhelm, 2012). The authors concluded that EW may not be effective for individuals with higher degrees of depressive symptoms (Baikie et al., 2012). Researchers have also recommended caution when using EW with PTSD populations. Smyth and colleagues (2008) studied changes in PTSD symptoms, mood states, posttraumatic growth, and cortisol reactivity after individuals (n = 25) with PTSD
completed EW and indicated that EW is a safe procedure for this population to use; that said, these authors did state that a participant withdrew from their trial due to distress caused from the writing task. Symptom severity can affect EW efficacy, as Reddy and colleagues (2014) found posttraumatic symptom severity before completing EW significantly predicted severity after one month. Whether EW can emotionally engage individuals and reduce PTSD symptoms regardless of symptom severity should be examined to help establish its efficacy for PTSD populations.

1.5 Online Treatment

Researchers have investigated how treatment protocols can be adapted to utilize technological advances with computers and the availability of online networks (Possemato, Ouimette, & Geller, 2010; Wong & Rochlen, 2009). Computer programs and Internet-assisted therapy have been developed for relaxation and breathing exercises, exposure therapy, cognitive-behavioural therapy, and acceptance and commitment therapy for depression, simple phobias, panic disorder, obsessive-compulsive disorder, generalized anxiety disorder, and social anxiety disorder (for review see Abbott, Klein, & Ciechomski, 2008; Taylor & Luce, 2003). Computer-based interventions have obtained similar results on psychological treatment outcomes compared to face-to-face therapeutic interactions, while increasing accessibility for mental health services (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Hanley & Reynolds, 2009; Kaltenhaler, Parry, & Beverley, 2004). In a meta-analysis assessing 19 randomized controlled trials \( (n = 1,170) \) that examined the efficacy of computer- or online-based treatments, researchers demonstrated that computer or online treatment for anxiety had similar therapy outcomes to treatment delivered by therapists, and significantly greater improvements on anxiety,
depression, dysfunctional thinking, and general distress and functioning measures than placebo or waitlist conditions (Reger & Gahm, 2008). Researchers specifically assessing the efficacy of online therapy for PTSD symptoms have also found that when therapeutic interventions (e.g., cognitive behavioural therapy) are administered online, individuals experience significantly reduced symptoms post-intervention (Lange et al., 2003; Spence et al., 2014; Wagner, Schulz, & Knaevelsrud, 2012), which can be maintained three months later (Klein et al., 2010; Knaevelsrud & Maercker, 2007). As computer and online platforms for therapeutic services continue to develop, researchers should continue tailoring treatment to idiosyncratic concerns and clarify who will benefit from receiving such forms of treatment (Carlbring, Andersson, & Kaldo, 2011).

The clinical treatment utility of online EW for mental health conditions requires computer-based communication (i.e., typing), a modality that can increase levels of self-disclosure when compared with face-to-face interactions (Joinson, 2001); however, related research remains limited (Baikie et al., 2012). A recent investigation found that posttraumatic symptoms were reduced following a typed EW task over the course of three days in a sample (n = 183) of Hispanic students (Hirai et al., 2012), suggesting that adapting EW to an online platform may be promising for reducing PTSD symptoms. Sayer and colleagues (2015) also found war veterans (n = 1,292) who completed Internet-based EW by typing had greater reductions in PTSD symptoms six months after treatment compared to a no writing experimental condition, and less clinically significant distress and number of individuals with probable PTSD (i.e., high symptom severity) in comparison to factual control and no writing experimental conditions. None of the three investigations compared how hand-written EW may have produced different treatment
outcomes. Hand-writing has been found to improve the factual recall and conceptual application of information over typing (Mueller & Oppenheimer, 2014), which may relate to differential processing when traumatic events are recalled during EW. Thus, studying differences in effect between typed and hand-written EW is essential as the processing of traumatic events may differ.

Despite writing modality potentially affecting trauma processing, very few studies have assessed such differences. An investigation comparing typed and hand-written EW in students (n = 80) who disclosed a distressing event demonstrated that participants in the hand-written condition had significantly greater self-disclosure and found the task significantly more helpful than those in the typed condition (Brewin & Lennard, 1999). That said, affective arousal, perceived benefit, or linguistic output (e.g., use of emotion words) did not differ in students (n = 168) writing about an emotional or neutral topic assigned to typed or hand-written conditions (Sharp & Hargrove, 2004). In a study examining the efficacy of EW using different delivery methods and settings, typed EW had similar reductions in physical health symptoms compared to a hand-written format in students (n = 76) who disclosed a traumatic event (Corter & Petrie, 2008). Whether EW produces different PTSD symptom outcomes based on completion modality remains unknown and an important area in need of examination.

2. Investigation

2.1 Purpose

Evidence regarding the efficacy of EW for treating PTSD symptoms is equivocal and requires further inquiry. Writing modality may also influence the efficacy of EW in reducing PTSD symptoms by influencing an individual’s emotional self-disclosure;
nevertheless, studies have not directly assessed if there are any differences in PTSD treatment outcomes between typed and hand-written EW. The present investigation was designed primarily to examine whether typed and hand-written EW are equally efficacious in reducing PTSD symptoms in individuals with clinically significant presentations of PTSD, as determined by declines in PTSD Checklist-5 (Weathers, Litz, Huska, & Keane, 2013) scores, when compared to an experimental control.

The present investigation was also designed to examine how constructs that influence emotional engagement with EW affect its efficacy when individuals with clinically significant PTSD symptoms completed this task. Researchers have found emotional expressiveness and ambivalence over emotional expression were both negatively correlated to PTSD symptoms when EW was completed (Lu & Stanton, 2009; Niles et al., 2014). Emotional approach coping also characterizes emotional expression and may affect an individual’s level of emotional engagement and symptom outcomes when completing EW. Negative affect has been associated with EW efficacy for decreasing PTSD symptoms (Hoyt & Yeater, 2011); whether the effect is robust when other emotional factors are considered remains unknown. Levels of emotional recognition (i.e., alexithymia, dissociation, absorption) and symptom severity may also affect an individual’s emotional engagement with EW and, consequently, symptom changes, but the relationships remain relatively under-researched in PTSD populations.

The present investigation was designed to clarify how variables pertaining to emotional expressiveness, ambivalence to emotional expression, emotional approach coping, negative affect, alexithymia, dissociation, absorption, and symptom severity impact PTSD symptom outcomes upon the completion of EW. The constructs were examined
through scores on the Emotional Expressiveness Questionnaire (i.e., emotional expressiveness; King & Emmons, 1990), Ambivalence over Emotional Expressiveness Questionnaire (i.e., ambivalence to emotional expression; King & Emmons, 1990), Emotional Approach Coping (i.e., emotional approach coping; Kirk, Cameron, & Danoff-Burg, 2000); Positive and Negative Affect Scale (i.e., negative trait emotionality; Watson, Clark, & Tellegen, 1988); Toronto Alexithymia Scale (i.e., alexithymia; Bagby, Parker, & Taylor, 1994), Attentional Resource Allocation Scale (i.e., dissociation, absorption; Carletton et al., 2010); and the PTSD Checklist-5 (i.e., symptom severity; Weathers et al., 2013).

2.2 Hypotheses

The present investigation assessed whether EW can be effective in alleviating PTSD symptoms when administered as an intensive (i.e., one day) treatment. Comparisons were made between PTSD symptoms reported by individuals who wrote about their deepest feelings and thoughts associated with their most traumatic experience through EW and individuals in a control condition who objectively wrote about their day. Individuals either hand-wrote or typed the writing tasks, resulting in four experimental groups (i.e., hand-written EW, typed EW, hand-written control, typed control). Hypotheses for completing the four writing tasks were the following:

1. Participants in the EW condition, regardless of modality (i.e., writing or typing format), will have statistically significant declines ($p < .05$) in PTSD symptoms from pre- and post-intervention, whereas those in the control condition, regardless of modality, will not demonstrate statistically significant reductions in PTSD symptoms.
2. Participants in the EW condition, regardless of modality (i.e., writing or typing format), will have clinically significant declines (i.e., a 10-point reduction; Weathers et al., 2013) in PTSD symptoms from pre- to post-intervention, whereas those in the control condition, regardless of modality, will not demonstrate this reduction.

Constructs suspected to influence emotional engagement when PTSD populations complete EW were also examined to explore their impact on the efficacy of EW. Hypotheses regarding the constructs and their impact on PTSD symptoms upon completion of the four writing tasks were as follows:

3. Symptom severity can predict PTSD symptoms after EW is completed (Reddy et al., 2014); therefore, pre-intervention PTSD symptom severity will significantly impact ($p < .05$) post-intervention severity in all experimental groups. However, participants in EW conditions will have significantly lower post-intervention PTSD symptoms ($p < .05$) compared to both control conditions when controlling for pre-intervention severity.

4. Alexithymia will significantly impact ($p < .05$) pre- to post-intervention PTSD symptoms amongst participants in each experimental group since PTSD symptom severity is positively related to alexithymia (Frewen, Pain, Dozois, & Lanius, 2006; McCaslin et al., 2006; Söndergaard & Theorell, 2004).

5. Dissociation (i.e., dissociative amnesia and attentional dissociation) will significantly impact ($ps < .05$) pre- to post-intervention PTSD symptoms amongst participants in each experimental group given that severity of
dissociation is positively correlated with PTSD symptoms (Feeny et al., 2005; Ozer, Best, Lipsey, & Weiss, 2003).

6. Absorption will significantly impact \((p < .05)\) pre- to post-intervention PTSD symptoms amongst participants in each experimental group since attention bias towards threat can predict the presence of PTSD symptoms (Naim et al., 2014).

7. Negative affect will significantly impact \((p < .05)\) pre- to post-intervention PTSD symptoms amongst participants in each experimental group given that PTSD severity is positively associated with negative affect (Parslow, et al., 2006; Shapinsky et al., 2005).

8. Emotional expressiveness and ambivalence over emotional expressiveness will significantly impact \((p < .05)\) pre- to post-intervention PTSD symptoms based on participants’ experimental groups. Participants in EW groups, regardless of modality (i.e., writing or typing format), will be influenced by these constructs given psychological symptom reductions when EW is completed are greater in individuals with higher levels of emotional expressiveness (Niles et al., 2014) and ambivalence over emotional expressiveness (Lu & Stanton, 2009), whereas both control groups will not be impacted.

9. Emotional approach coping will significantly impact \((p < .05)\) pre- to post-intervention PTSD symptoms based on participants’ experimental groups. Participants in EW groups, regardless of modality (i.e., writing or typing format), will be influenced by this construct since emotional coping predicts
symptom declines in psychological and physical conditions when EW is used (Hemenover, 2003; Frattaroli, 2006; Sloan & Marx, 2004; Sloan et al., 2005; Sloan et al., 2007), whereas both control groups will not be impacted.

2.3 Participants

Ethical approval to conduct the trial was obtained through the University of Regina Research Ethics Board (Appendix A). Sample size was determined using G*Power 3.1.7. Using alpha = .05 and power = .95, n = 32 participants was calculated as sufficient to assess for a medium effect ($f^2 = 0.30$) in the hypothesized relationships. Participants were recruited through advertisements placed throughout Regina, Saskatchewan. A community and student sample of individuals aged 18 to 65 years who endorsed experiencing a traumatic event and had clinically significant PTSD symptoms (determined by the PTSD Checklist-5) was recruited between April to October 2015. Recruitment stopped once the target sample size was met. All data, including follow-up responses, were collected by November 2015.

Interested individuals were invited to complete an online survey (Appendix B) to determine their eligibility. Individuals were considered eligible to participate in this investigation if they (a) met the age requirements; (b) reported having experienced at least one traumatic event; (c) had a score greater or equal to 38 on the PTSD Checklist-5; (d) were proficient in speaking, reading, and writing in English; and (e) were willing to complete the study at the University of Regina.

2.4 Screening and Primary Outcome Measures

2.4.1 Sociodemographics questionnaire. The sociodemographics questionnaire (Appendix B) asked individuals about gender; age; proficiency in speaking, writing, and
understanding English, French, or another language; presence of a learning disability diagnosis; contact information; willingness to attend the University of Regina to complete the study; relationship, residency, education, and employment status; and racial identification. Data collected from this survey were used to determine participant eligibility and characterize the participant sample.

2.4.2 Traumatic Life Events Questionnaire (TLEQ; Carleton, Brundin, Asmundson, & Taylor, 2006). The TLEQ (Appendix C) is a checklist presenting 16 specific traumatic events that may occur in a person’s lifetime, such as physical and sexual assault, accident (e.g., automobile), disaster (e.g., hurricane, flood, earthquake), combat or warfare, and life threatening illness. Respondents also have the opportunity to report a traumatic event experienced that is not listed. If respondents list more than one traumatic experience, they are asked to indicate which experience was the most distressing and the level of distress this event caused on a 5-point Likert scale from 1 (no distress) to 5 (extreme distress). The TLEQ then asks when respondents first experienced a traumatic event and when the most recent traumatic event occurred (i.e., within the last month, 1 to 3 months ago, 4 to 6 months ago, 7 months to 1 year ago, 1 to 3 years ago, or 4 or more years ago). Data collected from this measure were used to characterize the study sample and determine participant eligibility.

2.4.3 PTSD Checklist-5 (PCL-5; Weathers et al., 2013). The PCL-5 (Appendix D) is a 20-item self-report measure that assesses PTSD symptoms that have occurred within the past month as described in DSM-5. Symptoms are clustered in four subscales (i.e., re-experiencing, avoidance, negative cognitions and moods, hyperarousal; APA, 2013). Items are rated on a 5-point Likert scale ranging from 0 (not at all) to 4
(extremely) and are rated in response to a specific traumatic event. Respondents are also required to specify when the selected event took place. The PCL-5 was recently developed to reflect PTSD criteria in the *DSM-5*. Psychometric properties of the PCL-5 are still being determined; however, two studies have demonstrated strong correlations between the PCL-5 and earlier psychometrically sound versions of the PCL (*rs* = .88 and .97; Brief, Rubin, & Keane, 2013). In two studies, the PCL-5 had high levels of internal consistency (Cronbach’s *α* = .97 and .95; Brief et al., 2013). Preliminary results recommend 38 points as a cut-off for clinical PTSD (Weathers et al., 2013). The PCL-5 was used as a screening and primary outcome measure.

In the current investigation, the PCL-5 was administered to participants three times at each data collection point: 1) the eligibility questionnaire, 2) after completing all three writing study tasks, and 3) the optional follow-up survey. In the present trial, the PCL-5 had acceptable pre-intervention internal consistency (Cronbach’s *α* = .78) and an average inter-item correlation of .17 and good post-intervention (Cronbach’s *α* = .89) and follow-up (Cronbach’s *α* = .89) internal consistency with average inter-item correlations of .30 at both time points.

### 2.5 Secondary Outcome Measures

#### 2.5.1 Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)

The PANAS (Appendix E) is a 20-item self-report measure that will be used to assess state positive and state negative affect. Using a 5-point Likert scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*), individuals rate the extent to which they are currently experiencing the 20 emotions listed. The PANAS has good internal consistency on positive (Cronbach’s *α* = .89) and negative (Cronbach’s *α* = .85) subscales for state
affect (Watson et al., 1988) and correlates with measures of anxiety and depression (Crawford & Henry, 2004). The measure was administered following the completion of the three writing tasks in this investigation. Only PANAS negative affect was examined in this investigation and had good internal consistency (Cronbach’s α = .88) and an average inter-item correlation of .41.

2.5.2 Toronto Alexithymia Scale (TAS; Bagby et al., 1994). The TAS (Appendix F) is a 20-item self-report measure that assesses symptoms of alexithymia, including (a) difficulty describing emotions, (b) difficulty identifying emotions, and (c) tendency to focus attention externally (Bagby et al., 1994). Items are rated using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Items 4, 5, 10, 18, and 19 are reverse-scored. Individuals with total scores of 52 to 60 are considered to have possible alexithymia, whereas total scores of 61 or higher suggest alexithymia (Bagby et al., 1994). The TAS has demonstrated good internal consistency (Cronbach’s α = .81) and acceptable test-retest reliability after three weeks (r = .77, p < .01; Bagby et al., 1994). The measure was administered following the completion of the three writing tasks and had acceptable internal consistency (Cronbach’s α = .72) and an average inter-item correlation of .10 in the present trial.

2.5.3 Emotional Expressiveness Questionnaire (EEQ; King & Emmons, 1990). The EEQ (Appendix G) is a 16-item self-report measure that assesses an individual’s tendency to express positive emotions, negative emotions, and intimacy. Items are rated using a 7-point Likert scale ranging from 1 (do not agree at all) to 7 (strongly agree) with higher scores indicating greater emotional expression (King & Emmons, 1990). The EEQ has demonstrated good total scale internal consistency (Cronbach’s α = .78) while
each subscale has demonstrated questionable to acceptable internal consistency (expression of positive emotions, Cronbach’s $\alpha = .74$; expression of negative emotions, Cronbach’s $\alpha = .67$; expression of intimacy, Cronbach’s $\alpha = .63$; King & Emmons, 1990). All subscales have been positively correlated in previous studies; however, the expression of positive emotions and expression of intimacy subscales demonstrated a higher correlation ($r = .58$) than their correlations to the expression of negative emotions subscale ($r = .29$ and $r = .37$, respectively; King & Emmons, 1990). In the present trial the measure was administered following the completion of the three writing tasks and had questionable internal consistency (Cronbach’s $\alpha = .61$) and an average inter-item correlation of .09.

2.5.4 Ambivalence over Emotional Expressiveness Questionnaire (AEQ; King & Emmons, 1990). The AEQ (Appendix H) is a 28-item self-report measure that assesses an individual’s conflict over the expression of experienced positive and negative emotions, assessing the desire to express emotions and regret over expressed emotion. Participants rate each statement on a 5-point Likert scale from 1 (I have never felt like this) to 5 (I frequently feel like this). Higher scores indicate greater ambivalence. Total AEQ scores have demonstrated good internal consistency, stability over a six-week period, and discriminant validity with emotional expressiveness (King & Emmons, 1990). Scores on the AEQ demonstrated positive correlations with measures assessing daily negative affect, obsessive and compulsive tendencies, depression, paranoid ideation, and phobic anxiety, researchers having suggested that ambivalence over emotional expression has a significant relationship psychological distress (King & Emmons, 1990). The measure was administered following the completion of the three
writing tasks and had excellent internal consistency (Cronbach’s $\alpha = .92$) and an average inter-item correlation of .30 in this investigation.

2.5.5 Emotional Approach Coping (EAC; Stanton et al., 2000). The EAC (Appendix I) is an 8-item self-report measure that assesses an individual’s attempts to acknowledge, explore, and understand emotions and verbal or nonverbal efforts to communicate or symbolize emotional experience. Participants are asked to rate their response to stress on a 4-point Likert scale from 1 (I usually don’t do this at all) to 4 (I usually do this a lot). Lower scores represent poorer emotional coping (Stanton et al., 2000). Each subscale and total scale has demonstrated excellent internal consistency (Cronbach’s $\alpha s \geq .91$) and acceptable test-retest reliability over four weeks (EAC total, $r = .78$; EAC emotional processing subscale, $r = .78$; EAC emotional expression subscale, $r = .74$; Stanton et al., 2000). In this investigation the measure was administered following the completion of the three writing tasks and had excellent internal consistency (Cronbach’s $\alpha = .92$) and an average inter-item correlation of .58.

2.5.6 Attentional Resource Allocation Scale (ARAS; Carleton et al., 2010). The ARAS (Appendix J) is a 15-item self-report measure that assesses attention-modifying trait constructs and consists of three subscales (i.e., absorption, dissociative amnesia, and attentional dissociation). Items are rated on a 5-point Likert scale from 0 (never) to 4 (always). The ARAS has demonstrated acceptable internal consistency in undergraduate samples (Cronbach’s $\alpha = .85$) and excellent internal consistency in community samples (Cronbach’s $\alpha = .91$; Carleton et al., 2010). In the present trial the measure was administered following the completion of the three writing tasks and examined according to its three subscales. Dissociative amnesia had questionable internal consistency.
(Cronbach’s α = .67) and an average inter-item correlation of .29 in the present trial, while attentional dissociation had acceptable internal consistency (Cronbach’s α = .70) and an average inter-item correlation of .37. Meanwhile, absorption had acceptable internal consistency (Cronbach’s α = .80) and an average inter-item correlation of .40.

2.6 Debriefing Assessment

Participants were asked three questions to assess their reactions to the writing tasks once all writing sessions and questionnaires were completed. The questions were identical to those used by Pennebaker, Colder, and Sharp (1990): (1) How helpful was this writing task for you? (2) How distressing was this writing task for you?, and (3) How difficult has it been for you to write about this experience? Answers were provided on a 5-point Likert scale from 1 (not at all) to 5 (extremely). This data was collected in the same private experimental room participants completed the study tasks. Responses were used to characterize participants’ perceptions of the experimental conditions.

2.7 Website

Qualtrics—an online platform that facilitates the collection and storage of web-based survey research—was used to administer all online aspects (i.e., all questionnaires and study writing tasks) of the investigation. Except for the debriefing responses, all data were collected on this platform. The primary investigator and faculty supervisor were the only persons with access to participant input from the website.

2.8 Procedure

Participants were recruited through class announcements in psychology courses held at the University of Regina, the University of Regina Psychology Participant Pool, and advertisements placed throughout the University of Regina campus, online postings (i.e., usedregina.com, kijiji.ca, craigslist.com), and mental health centres in the
community of Regina, Saskatchewan. Individuals were informed about a study examining writing interventions for posttraumatic stress symptoms in promotional notices. The advertisements also notified individuals that participants would receive course credit or a $15 Tim Hortons gift card; students recruited through the University of Regina Psychology Participant Pool had the option to receive either compensation. A link to an online screening questionnaire and the primary investigator’s email address were also provided for individuals to receive more information.

The procedure is depicted in Figure 1. The present investigation was a randomized controlled trial, whereby eligible individuals were randomized into one of two task (i.e., control vs. EW) and writing (i.e., typed vs. hand-written) conditions; therefore, there were four experimental groups. Simple randomization was completed using a generator for randomization (www.randomization.com) and produced the allocation sequence. Once participants’ study appointments were confirmed with researchers, participants were immediately and sequentially assigned to study conditions (i.e., hand-written EW, typed EW, hand-written control, typed control) by the primary investigator based on the generated randomization sequence. Participants were not aware that this investigation had other task and writing conditions; as such, participants were blinded to randomization. The investigation entailed three 15-minute writing sessions, as recommended for participants with a history of trauma (Frattaroli, 2006), in one day. The writing instructions and procedure were similar to those of Pennebaker and Beall (1986) and have been widely used in EW studies (Baikie et al., 2012; Baikie & Wilhelm, 2005; Pennebaker & Chung, 2007). One difference from the standard procedure was that participants in the EW conditions were asked to write about the same traumatic event
Figure 1. Study protocol.
throughout the three writing sessions as researchers have found significantly greater reductions in PTSD symptom severity when one traumatic event is focused on across writing sessions (Sloan et al., 2005). Each trial component is explained in further detail below.

2.8.1 Eligibility screen and initial discussion. Individuals interested in participating in the investigation were directed to a secure website run by Qualtrics to complete a screening questionnaire. Participants were then provided with an information and consent form that detailed the rationale and procedure for the investigation. To proceed with the screening questionnaire, individuals must have indicated that they read and understood all components of the information and consent form and that they wanted to participate in the trial. Consenting individuals were then directed to the sociodemographic questionnaire to determine their eligibility for the trial. Potential participants who met the first round of eligibility criteria were immediately re-directed and asked to complete the TLEQ. Those who met this eligibility requirement were then re-directed and instructed to complete the PCL-5 to confirm the final eligibility requirement. Individuals were automatically notified about their eligibility for the investigation once the survey was completed. Ineligible individuals were thanked for their interest and participation.

Upon completing the screening questionnaire, eligible individuals were informed that a researcher would contact them within one to two business days. The initial contact was designed to (a) discuss the investigation rationale and procedure, (b) re-affirm consent, and (c) schedule a start date. Individuals were phoned unless they indicated a preference for contact by email on the screening questionnaire. Eligible individuals who
were emailed only had their start date confirmed, while those who were phoned reviewed all components of this discussion with a researcher. Attempts to contact individuals through email were also made if three attempts to make contact by phone were unsuccessful. The investigation rationale and study procedure were reviewed with emailed participants on the day of their appointment before study tasks were administered. During the initial contact participants were notified they would be given a quiet, comfortable, and private room to complete the study tasks. Participants were also informed that some individuals may find the writing tasks upsetting and to notify researchers, who would be present in the Anxiety and Illness Behaviours Laboratory as they completed the study tasks, to receive immediate assistance if needed.

Participants attended the Anxiety and Illness Behaviours Laboratory on the scheduled start day and time and were greeted by a researcher. The researcher led participants to a private room with a laptop and ensured participants were comfortable completing the study tasks in this location. The researcher then instructed participants to read the instructions and notices presented on the computer screen. The screen notices reviewed the possibility of experiencing strong emotional distress during completion of the study tasks. Participants were informed to stop with the study tasks if this occurred and ask for assistance if needed. They were also reminded that their participation was voluntary and that they could discontinue their participation at any time free of any penalty. Participants were asked to proceed after reviewing these notices. The remainder of the procedure was dependent upon participants’ writing conditions, as described below and detailed in Appendices K and L.
2.8.2 Hand-written paradigm. Participants in the hand-written paradigm were given paper and a pen to complete their writing tasks and informed to notify the researcher when they were ready to write. After participants indicated they were ready to begin, the researcher began timing and left the room. After 15 minutes had passed, the researcher entered the room and asked participants to immediately stop writing. Participants were asked to count the number of words in the third line of their writing sample and the number of lines written so that an estimate of their word count could be calculated. The researcher offered participants to keep their writing sample or have it immediately shredded. Participants were then given a 10-minute break and told to notify the researcher when they were ready to begin the next writing task. When instructed to continue by participants, the researcher notified participants to follow the same writing instructions and the procedure would be repeated. The same procedure (i.e., 15-minutes of writing, 10-minute break, estimate of word count, offer to keep writing sample) was repeated two additional times. At the end of the third 10-minute break, the researcher informed participants to proceed to the subsequent webpages and then left the room.

On the subsequent webpages the PCL-5, PANAS, EEQ, AEQ, EAC, TAS, and ARAS were presented sequentially through a guided electronic survey. After these measures were completed, participants were directed to a webpage indicating they completed the study tasks. A notice was also presented informing participants to notify the researcher the study tasks were completed.

2.8.3 Typed paradigm. Participants in the typed paradigm were directed to a webpage that provided a space where they could type their writing samples. Participants were also informed to notify the researcher when they were ready to write. After participants
indicated that they were ready to begin, the researcher began timing and left the room. After 15 minutes had passed, the researcher entered the room and asked participants to immediately stop writing. The word counts of participants’ writing samples were then determined to characterize how much participants wrote. Word counts were obtained by copying and pasting writing samples into a Wordpad document and using the Word Count function. An offer to print the writing sample was then made to participants. The writing samples of those who did not wish to keep their work were immediately deleted. Participants were then given a 10-minute break and told to notify the researcher when they were ready to begin the next writing task. When instructed to continue by participants, the researcher notified participants to follow the same writing instructions and the procedure would be repeated. The same procedure (i.e., 15-minutes of writing, 10-minute break, estimate of word count, offer to print) was repeated two additional times. At the end of the third 10-minute break, the researcher informed participants to proceed to the subsequent webpages and then left the room.

On the subsequent webpages the PCL-5, PANAS, EEQ, AEQ, EAC, TAS, and ARAS were presented sequentially through a guided electronic survey. After these measures were completed, participants were directed to a webpage indicating they have completed the study tasks and to notify the researcher. A notice was also presented informing participants to notify the researcher the study tasks were completed.

2.8.4 Debriefing. Participants were debriefed by the researcher immediately after completing the study tasks. Participants completed the debriefing assessment as described in section 2.6 and were notified that they would receive an email in one week with access to an optional follow-up survey that would ask about their PTSD symptoms. Participants
were then informed as to where they could continue to seek psychological services in case they were still interested in receiving treatment, notified about the other experimental conditions in the investigation, and the rationale for the investigation’s procedure. Participants were also provided with the website (www.aibl.ca) where the findings of this investigation would be posted. They were then given the opportunity to ask questions, which were promptly addressed, and offered a copy of the debriefing form. Participants were thanked for their participation and immediately reimbursed.

2.8.5 Follow-up questionnaire. All participants who completed the study tasks received an email from the primary investigator one week after their study appointment. This email asked participants to complete a 5-minute follow-up survey inquiring about their PTSD symptoms (i.e., PCL-5). Participants were informed that completing this survey was optional and they would not be reimbursed. Participants were notified this email concluded their participation in the investigation.

2.9 Analyses

2.9.1 Preliminary analyses and participant characteristics. Descriptive and frequency statistics were conducted on participants’ screening questionnaire responses to gather sociodemographic information on all individuals who took part in this investigation. Frequency statistics were also performed to identify the most distressing traumas participants’ endorsed, while descriptive statistics were used to assess participants’ baseline levels of distress and symptoms associated with their most distressing traumatic event. Consistent with the Consolidated Standards of Reporting Trials (Schulz, Altman, & Moher, 2010) guidelines, hypothesis testing for descriptive differences between the experimental groups was not conducted as random assignment
ensures that any group differences are due to chance. All continuous variables used in the analysis of covariance (ANCOVA) and analysis of variance (ANOVA) analyses were tested for outliers and assumptions of normality and homogeneity of variance within each independent variable grouping (i.e., assigned writing condition) and then their correlations were computed. Additional plots and tests were examined to assess the ANCOVA assumptions of linearity, independence of the covariate and treatment effect, and homogeneity of regression slopes.

Word counts and debriefing responses were collected to characterize participants’ reactions to their assigned writing tasks. A one-way ANOVA was conducted to examine any significant differences on word counts and debriefing responses based on participants’ assigned writing conditions. The data were not assessed for outliers, skewness, kurtosis, normality, and homogeneity of variance as the purpose was to characterize participants’ experiences with the writing tasks; as such, all responses from the debriefing assessment were used in the one-way ANOVA performed.

2.9.2 Primary analyses. Hypotheses 1 and 2 examined whether completing the experimental writing conditions significantly reduced pre- to post-intervention PTSD symptoms or differed in efficacy. To test Hypothesis 1, a mixed design ANOVA was conducted to evaluate the differences in pre- to post-intervention PTSD symptoms due to the completion of different writing tasks. To test Hypothesis 2, changes in PTSD symptoms from pre- to post-intervention were first determined. Means and standard deviations of PTSD symptom changes were then calculated for each experimental condition to assess whether there were any clinically significant changes (i.e., a 10-point reduction; Weathers et al., 2013) in any group.
2.9.3 Secondary analyses. Hypothesis 3 was tested by performing a one-way ANCOVA to assess whether participants’ pre-intervention PTSD symptoms influenced post-intervention symptom ratings amongst the experimental conditions. Hypotheses 4 to 9 were tested by performing a mixed design ANCOVA. The ANCOVA assessed the effects of time, experimental condition, and each emotional engagement factor (i.e., alexithymia, dissociation, absorption, negative affect, emotional expressiveness, ambivalence to emotional expressiveness, and emotional coping) on pre- to post-intervention PTSD symptoms. The presence of a reading or writing learning disability diagnosis and whether participants saw a treatment provider for their mental health concerns were also controlled for in this analysis. A similar mixed design ANCOVA was then performed using only the significant covariates found.

3. Results

3.1 Preliminary Analyses and Participant Characteristics

An overview of participant flow is provided in Figure 2. Of the 136 individuals who completed the online screening questionnaire, 38 met all eligibility requirements. Attempts to contact all 38 eligible individuals were made by phone or email. Out of the 38 eligible respondents, 30 individuals participated in the in-lab segment of the study; however, one participant did not complete the study procedure. Data for this participant were excluded from all analyses except for the data presented in Table 1. Of the 29 participants who completed the trial, 31% completed the optional follow-up questionnaire. Due to the scope of this investigation and high attrition rate, follow-up data were not analyzed.
Assessed for eligibility (n = 136)

Excluded (n = 98)
- Not meeting inclusion criteria (n = 84)
- Declined to participate (n = 9)
- Partial completion (n = 4)
- Conflicting schedules (n = 1)

Randomized (n = 38)

EW, Hand-written
Allocated to intervention (n = 11)
- Received allocated intervention (n = 8)
- Did not receive allocated intervention (n = 3)
  - No show (n = 1)
  - Did not follow-up to re-schedule (n = 2)

EW, Typed
Allocated to intervention (n = 8)
- Received allocated intervention (n = 7)
- Did not receive allocated intervention (n = 1; withdrew consent)

Control, Hand-written
Allocated to intervention (n = 11)
- Received allocated intervention (n = 7)
- Did not receive allocated intervention (n = 4)
  - No show (n = 1)
  - Did not follow-up to reschedule (n = 3)

Control, Typed
Allocated to intervention (n = 8)
- Received allocated intervention (n = 8)
Figure 2. Participant flow

Lost to follow-up (n = 4)
- Did not complete survey (n = 3)
- Discontinued intervention
- Withdrew consent (n = 1)

Lost to follow-up (n = 5)
- Excluded from analysis (n = 1; withdrew consent)

Lost to follow-up (n = 8)
- Analyzed (n = 7)
- Analyzed (n = 8)
Table 1

**Participant Characteristics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW groups</th>
<th>Control groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HW (n = 8)</td>
<td>Typed (n = 7)</td>
</tr>
<tr>
<td>Age</td>
<td>M 30.38</td>
<td>SD 16.36</td>
</tr>
<tr>
<td></td>
<td>n 8</td>
<td>n 7</td>
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<tr>
<td>Sex</td>
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<tr>
<td></td>
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</tr>
<tr>
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<td></td>
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</tr>
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<tr>
<td></td>
<td>African-Canadian 0</td>
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</tr>
<tr>
<td></td>
<td>Hispanic/Latino 0</td>
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</tr>
<tr>
<td>Education</td>
<td>Less than high school 0</td>
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<td></td>
<td>High school 6</td>
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</tr>
<tr>
<td></td>
<td>Associate or technical degree 2</td>
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</tr>
<tr>
<td></td>
<td>Bachelor’s degree 0</td>
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<tr>
<td></td>
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<tr>
<td>Employmenta</td>
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<td></td>
<td>Looking for work 2</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Not looking for work 0</td>
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<tr>
<td></td>
<td>Unable to work 1</td>
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<td></td>
<td>Homemaker 0</td>
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<td></td>
<td>Student 5</td>
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<td></td>
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<tr>
<td>Housing Alone</td>
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<td>2</td>
</tr>
<tr>
<td>Housing With spouse or partner</td>
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<td>1</td>
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<tr>
<td>Housing With roommate</td>
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<td>0</td>
</tr>
<tr>
<td>Declined to answer</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Learning Disability Yes</td>
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<td>1</td>
</tr>
<tr>
<td>Learning Disability No</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Learning Did not answer</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Treatment Yes</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Treatment No</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Treatment Did not answer</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* Demographic statistics are based on all participants who began the study tasks. EW = expressive writing; HW = hand-writing.

*a*Participants were instructed to select all that applied.
A summary of participants’ sociodemographic information by experimental condition is provided in Table 1. Frequencies of the most distressing traumas participants experienced are shown in Table 2. “Other” endorsed traumas were the following: physical and mental abuse, childhood bullying, a physical attack, a dog attack, occupational exposure to aversive experiences (e.g., body mutilation, suicides, beheadings, burnt bodies), and being told imminent surgery would be fatal. The range of participants’ pre-intervention PTSD symptoms as determined by the PCL-5 was 38 to 76 ($M = 52.76, SD = 10.62$). Table 3 shows participants’ baseline levels of distress and PTSD symptoms based on experimental condition.

Pre- and post-intervention PCL-5 scores and all emotional engagement factors (i.e., alexithymia [TAS]; attentional dissociation [ARAS-AD]; dissociative amnesia [ARAS-DA]; absorption [ARAS-A]; negative affect [PANAS-NA]; emotional expression [EEQ]; ambivalence over emotional expression [AEQ]; and emotional approach coping [EAC]) were assessed for outliers, skewness, kurtosis, normality, and homogeneity of variance since these analyses are recommended in statistical texts (e.g., Field, 2013). Standardized scores of these variables were calculated and used to identify univariate outliers within each experimental condition. There were three potential outliers, identified by a standardized score of 1.96 to 2.57, in the control typed condition with one each in the pre-intervention PCL-5, AEQ, and ARAS-A scores. An additional potential outlier was also identified in the ARAS-A scores of the control hand-written condition. All data remained in the subsequent analyses since extreme outliers were not present.
### Table 2

*Frequency of Most Distressing Traumas*

<table>
<thead>
<tr>
<th>Trauma</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural disaster</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Motor vehicle accident</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>“Other” kind of accident</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Combat or warfare</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Sudden death of friend or loved one</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Life-threatening or disabling event to loved one</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Life-threatening illness</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Assaulted by another person</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Growing up: physically punished</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Physically hurt by intimate partner</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Before 13 year old: sexual contact with someone at least 5 years older</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>As teen: unwanted sexual contact</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>As adult: unwanted sexual contact</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Some “other” traumatic event</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

*Note.* Based on all participants who began the study tasks.
### Table 3

**Mean Baseline PTSD Symptoms**

<table>
<thead>
<tr>
<th>Baseline Assessment</th>
<th>EW groups</th>
<th>Control groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HW ($n = 8$)</td>
<td>Typed ($n = 7$)</td>
</tr>
<tr>
<td>Level of distress</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>PCL-5</td>
<td>56.25</td>
<td>10.48</td>
</tr>
</tbody>
</table>

*Note.* Based on all participants who began the study tasks. EW = expressive writing; HW = hand-written; PCL-5 = PTSD Checklist for DSM-V.
Skew and kurtosis estimates are presented in Table 4. Participants in the control typed condition had skew and kurtosis estimates for AEQ scores larger than recommended values (i.e., skew statistics divided by standard error were > 2; Field, 2013), though no violation of normality was found ($p = .11$) according to the Shapiro-Wilks test; therefore, all scores were permitted in the subsequent analyses. The ARAS-A scores of participants in the control hand-written condition also had skew and kurtosis estimates larger than recommended values and violated the assumption of normality ($p = .003$) according to the Shapiro-Wilks test. The data remained in the subsequent analyses as researchers have suggested that ANCOVA analyses—the analysis where this data would be used—are robust to violations of normality (Olejnik & Algina, 1984).

Homogeneity of variance was present in pre- and post-intervention PCL-5 scores ($ps \geq .26$) amongst all ANCOVA and ANOVA analyses according to Levene’s test.

Correlations between the utilized covariates are shown in Table 5.

Pre- and post-intervention PCL-5 scores were also assessed for the assumptions of linearity, independence of the covariate and treatment effect, and homogeneity of regression slopes before the one-way ANCOVA was performed. Graphs of standardized residuals against predicted values presented no concerns over linearity in any of the experimental conditions. An ANOVA was conducted to test independence of the treatment variable and covariate and confirmed pre-intervention PCL-5 scores were not significantly different amongst the experimental conditions, $F(3, 25) = 1.83$, $p = .17$, partial $\eta^2 = .18$. Finally, the interaction between experimental conditions and pre-intervention PCL-5 scores was non-significant, $F(3, 21) = .48$, $p = .70$, partial $\eta^2 = .06$, ...
Table 4

Skew and Kurtosis Statistics for All Independent Variables within Each Experimental Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW (n = 8)</th>
<th>HW (n = 7)</th>
<th>Typed (n = 6)</th>
<th>Control (n = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(SD)</td>
<td>S(SE)</td>
<td>K(SE)</td>
<td>M(SD)</td>
</tr>
<tr>
<td>PCL-5a</td>
<td>56.25</td>
<td>0.46</td>
<td>-1.61</td>
<td>52.17</td>
</tr>
<tr>
<td></td>
<td>(10.48)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(13.38)</td>
</tr>
<tr>
<td>PCL-5b</td>
<td>55.75</td>
<td>0.03</td>
<td>0.45</td>
<td>47.50</td>
</tr>
<tr>
<td></td>
<td>(9.10)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(13.68)</td>
</tr>
<tr>
<td>TAS</td>
<td>58.88</td>
<td>-0.48</td>
<td>-1.16</td>
<td>62.00</td>
</tr>
<tr>
<td></td>
<td>(12.30)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(12.02)</td>
</tr>
<tr>
<td>ARAS-AD</td>
<td>13.25</td>
<td>0.01</td>
<td>-1.19</td>
<td>9.17</td>
</tr>
<tr>
<td></td>
<td>(4.13)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(3.55)</td>
</tr>
<tr>
<td>ARAS-DA</td>
<td>13.50</td>
<td>-0.73</td>
<td>1.28</td>
<td>12.17</td>
</tr>
<tr>
<td></td>
<td>(3.38)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(3.37)</td>
</tr>
<tr>
<td>ARAS-A</td>
<td>16.63</td>
<td>0.28</td>
<td>-1.38</td>
<td>14.33</td>
</tr>
<tr>
<td></td>
<td>(6.91)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(7.15)</td>
</tr>
<tr>
<td>PANAS-NA</td>
<td>26.88</td>
<td>0.36</td>
<td>-1.57</td>
<td>31.50</td>
</tr>
<tr>
<td></td>
<td>(4.85)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(9.31)</td>
</tr>
<tr>
<td>EEQ</td>
<td>72.25</td>
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<td>-1.16</td>
<td>60.67</td>
</tr>
<tr>
<td></td>
<td>(9.08)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(12.23)</td>
</tr>
<tr>
<td>AEQ</td>
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<td>0.03</td>
<td>-1.66</td>
<td>102.83</td>
</tr>
<tr>
<td></td>
<td>(19.71)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(18.25)</td>
</tr>
<tr>
<td>EAC</td>
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<td>-0.57</td>
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</tr>
<tr>
<td></td>
<td>(6.18)</td>
<td>(0.75)</td>
<td>(1.48)</td>
<td>(4.68)</td>
</tr>
</tbody>
</table>

Note. EW = expressive writing; HW = hand-written; S = Skew; K = Kurtosis; PCL-5 = PTSD Checklist for DSM-V; TAS = Toronto Alexithymia Scale; ARAS-AD = Attentional Resource Allocation Scale, attentional dissociation; ARAS-DA = Attentional Resource Allocation Scale, dissociative amnesia; ARAS-A = Attentional Resource Allocation Scale, absorption; PANAS-NA = Positive and...
Negative Affect Schedule, negative subscale; EEQ = Emotional Expressiveness Questionnaire; AEQ = Ambivalence over Emotional Expressiveness Questionnaire; EAC = Emotional Approach Coping.
Table 5

**Correlation Matrix of ANCOVA Covariates**

<table>
<thead>
<tr>
<th></th>
<th>TAS</th>
<th>ARAS-AD</th>
<th>ARAS-DA</th>
<th>ARAS-A</th>
<th>PANAS-NA</th>
<th>EEQ</th>
<th>AEQ</th>
<th>EAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAS</td>
<td>1.00</td>
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<td>ARAS-AD</td>
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<td></td>
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<td>ARAS-DA</td>
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<td>.52*</td>
<td>1.00</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>ARAS-A</td>
<td>-.24</td>
<td>.72**</td>
<td>.54**</td>
<td>1.00</td>
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<td></td>
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<tr>
<td>PANAS-NA</td>
<td>.37</td>
<td>-.45*</td>
<td>-.10</td>
<td>-.25</td>
<td>1.00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>EEQ</td>
<td>-.14</td>
<td>.50**</td>
<td>.15</td>
<td>.31</td>
<td>-.39*</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AEQ</td>
<td>-.23</td>
<td>.21</td>
<td>.42*</td>
<td>.40*</td>
<td>-.03</td>
<td>-.24</td>
<td>1.00</td>
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<tr>
<td>EAC</td>
<td>-.22</td>
<td>.47**</td>
<td>.16</td>
<td>.26</td>
<td>-.50**</td>
<td>.42*</td>
<td>-.22</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note.* TAS = Toronto Alexithymia Scale; ARAS-AD = Attentional Resource Allocation Scale, attentional dissociation; ARAS-DA = Attentional Resource Allocation Scale, dissociative amnesia; ARAS-A = Attentional Resource Allocation Scale, absorption; PANAS-NA = Positive and Negative Affect Schedule, negative subscale; EEQ = Emotional Expressiveness Questionnaire; AEQ = Ambivalence over Emotional Expressiveness Questionnaire; EAC = Emotional Approach Coping.

* *p < .05, two-tailed. ** *p < .01, two-tailed.
confirming homogeneity of regression slopes existed in the ANCOVA model to be performed.

Table 6 displays a summary of the one-way ANOVA conducted on debriefing responses and word counts from the writing tasks. There were significant differences in reported distress, $F(3, 25) = 3.67, p = .03$, partial $\eta^2 = .31$, and difficulty, $F(3, 25) = 4.29, p = .01$, partial $\eta^2 = .34$, between the different writing conditions. Post hoc tests using Bonferroni comparisons identified participants who typed had reported significantly different levels of distress depending on whether they completed EW ($M = 3.33, SD = 0.82$) or control ($M = 1.63, SD = 1.06$) writing paradigms ($p = .04$); all other group comparisons of self-reported distress were non-significant ($ps \geq .10$). Despite the main ANOVA result, there were no significant differences found between groups and their reported difficulty completing the writing tasks ($ps \geq .08$) in the post hoc analysis.

The word counts between groups significantly differed ($ps \leq .003$) in all three writing sessions; accordingly, post hoc tests with Bonferroni comparisons were performed to examine the differences. In the first writing task there were significant differences in the following group comparisons: EW hand-written ($M = 352.00, SD = 88.98$) and control typed ($M = 544.00, SD = 133.50$) conditions ($p = .01$); EW typed ($M = 457.67, SD = 98.83$) and control hand-written ($M = 276.00, SD = 120.84$) conditions ($p = .04$); and typed ($M = 544.00, SD = 133.50$) and hand-written ($M = 286.86, SD = 79.14$) control conditions ($p < .001$). All other comparisons were non-significant ($ps \geq .42$). In the second writing task significant differences in word count comparisons existed again between participants in EW typed ($M = 493.00, SD = 144.91$) and control hand-written ($M = 276.00, SD = 120.84$) conditions ($p = .03$) and those in typed ($M = 555.63$,
Table 6

Word Counts and Feedback on Writing Tasks by Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>HW (n = 8)</th>
<th>Typed (n = 6)</th>
<th>HW (n = 7)</th>
<th>Typed (n = 8)</th>
<th>F</th>
<th>p</th>
<th>Partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Count</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>352.00</td>
<td>98.98</td>
<td>457.67</td>
<td>133.50</td>
<td>9.08**</td>
<td>&lt;.001</td>
<td>.52</td>
</tr>
<tr>
<td>2</td>
<td>434.00</td>
<td>144.91</td>
<td>493.00</td>
<td>139.94</td>
<td>6.28**</td>
<td>.003</td>
<td>.43</td>
</tr>
<tr>
<td>3</td>
<td>422.88</td>
<td>139.35</td>
<td>461.83</td>
<td>146.88</td>
<td>7.00**</td>
<td>.001</td>
<td>.46</td>
</tr>
<tr>
<td>Debriefing Question</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helpfulness</td>
<td>3.25</td>
<td>0.82</td>
<td>3.29</td>
<td>1.33</td>
<td>0.06</td>
<td>.98</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Distress</td>
<td>3.00</td>
<td>0.82</td>
<td>2.29</td>
<td>0.82</td>
<td>3.67*</td>
<td>.03</td>
<td>.31</td>
</tr>
<tr>
<td>Difficulty</td>
<td>3.25</td>
<td>1.17</td>
<td>1.86</td>
<td>1.17</td>
<td>4.29*</td>
<td>.01</td>
<td>.34</td>
</tr>
</tbody>
</table>

Note. Based on all participants who completed the study. EW = expressive writing; HW = hand-written.

* $p < .05$, two-tailed. ** $p < .01$, two-tailed.
SD = 139.94) and hand-written (M = 276.00, SD = 120.84) control conditions (p = .002); no other comparisons were significant (ps ≥ .16). By the third writing task, only typed (M = 589.13, SD = 146.88) and hand-written (M = 303.86, SD = 94.10) control conditions had any significant difference (p = .001) in word counts; all other comparisons were non-significant (ps ≥ .07).

3.2 Primary Analyses

A mixed design ANOVA was conducted to assess whether participants’ assigned writing condition (i.e., EW hand-written, EW typed, control hand-written, control typed) had any statistically significant effects on PCL-5 scores from pre- to post-intervention or significantly differed in these changes. Participants in both EW conditions had higher PCL-5 scores pre-intervention (Hand-written: M = 56.25, SD = 10.48; Typed: M = 52.17, SD = 13.38) compared to post-intervention (Hand-written: M = 55.75, SD = 9.10; Typed: M = 47.50, SD = 13.68). Participants completing control conditions had similar trends, whereby pre-intervention PCL-5 scores (Hand-written: M = 56.86, SD = 8.65; Typed: M = 46.13, SD = 8.22) were greater than post-intervention scores (Hand-written: M = 49.57, SD = 15.33; Typed: M = 42.37, SD = 17.03). There were no statistically significant changes in pre- to post-intervention PCL-5 scores due to time, F(1, 25) = 3.33, p = .08, partial η² = .12, group assignment, F(1, 25) = 1.75, p = .18, partial η² = .17, or their interaction, F(1, 25) = 0.42, p = .74, partial η² = .05, which indicates the interventions did not mitigate PTSD symptoms or differ in their effect on symptoms. Figure 3 shows PCL-5 scores as a function of time and experimental condition.

Means and standard deviations were calculated to assess whether the changes from pre- to post-intervention PCL-5 scores in any experimental condition were clinically
Figure 3. The effect of time on PCL-5 scores within each experimental condition.  
*Note.* EW = expressive writing; HW = hand-written.
significant. Participants who completed the control hand-written condition had the greatest reductions in PCL-5 scores ($M = 7.29, SD = 11.63$), followed by participants in the EW typed ($M = 4.67, SD = 9.73$); control typed ($M = 3.75, SD = 14.66$); and EW hand-written ($M = 0.50, SD = 10.27$) conditions. As such, no clinically significant changes (i.e., a 10-point reduction; Weathers et al., 2013) in PCL-5 scores were found in any experimental condition.

3.3 Secondary Analyses

3.3.1 Hypotheses 3. A one-way ANCOVA bootstrapped with 1000 samples was performed to assess whether post-intervention PCL-5 scores differed amongst the experimental conditions once pre-intervention scores were controlled for in the analysis. Once pre-intervention PCL-5 scores were controlled for, participants who completed the EW hand-written condition had the greatest post-intervention PCL-5 scores ($M = 55.75, SD = 9.10, 95\% BCa CI [49.13, 62.33]$), followed by participants in the control hand-written ($M = 49.57, SD = 15.33, 95\% BCa CI [37.68, 61.50]$); EW typed ($M = 47.50, SD = 13.68, 95\% BCa CI [37.00, 59.35]$); and control typed ($M = 42.37, SD = 17.03, 95\% BCa CI [29.83, 54.99]$) conditions. Pre-intervention PCL-5 scores had a significant effect on post-intervention scores, $F(1, 24) = 11.01, p = .003$, partial $\eta^2 = .31$, while experimental condition had a non-significant effect, $F(3, 24) = 0.46, p = .71$, partial $\eta^2 = .06$. Thus, evidence partially supporting the current hypothesis was found since pre-intervention PTSD symptom severity affected post-intervention severity.

3.3.2 Hypothesis 4 to 9. For Hypotheses 4 to 9, a mixed design ANCOVA was conducted to determine whether PCL-5 scores from pre- to post-intervention were affected by emotional engagement constructs. Table 7 displays the effects of each
Table 7

Within and Between Subject Effects on Posttraumatic Symptoms

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable(s)</th>
<th>Within Effects</th>
<th></th>
<th></th>
<th>Between Effects</th>
<th>Partial</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
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<td>$p$</td>
<td>$\eta^2$</td>
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<tr>
<td>1</td>
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<td>6.40$^*$</td>
<td>.02</td>
<td>.30</td>
<td>&lt;0.01</td>
<td>.96</td>
<td>&lt;.01</td>
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<td></td>
<td>Treatment Provider</td>
<td>0.54</td>
<td>.47</td>
<td>.04</td>
<td>4.33</td>
<td>.06</td>
<td>.22</td>
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<tr>
<td></td>
<td>TAS</td>
<td>4.87$^*$</td>
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<td>.25</td>
<td>0.41</td>
<td>.53</td>
<td>.03</td>
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<tr>
<td></td>
<td>ARAS-DA</td>
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<td>4.75$^*$</td>
<td>.046</td>
<td>.24</td>
<td></td>
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<tr>
<td></td>
<td>ARAS-AD</td>
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<td>1.51</td>
<td>.24</td>
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<td>ARAS-A</td>
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<td>PANAS-NA</td>
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<td>EEQ</td>
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<td>.29</td>
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<td>.95</td>
<td>&lt;.01</td>
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</tr>
<tr>
<td></td>
<td>TAS</td>
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<td>.04</td>
<td>.20</td>
<td>0.61</td>
<td>.44</td>
<td>.03</td>
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<tr>
<td></td>
<td>ARAS-DA</td>
<td>7.58$^*$</td>
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<td>.29</td>
<td>4.43$^*$</td>
<td>.049</td>
<td>.19</td>
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<tr>
<td></td>
<td>ARAS-AD</td>
<td>14.13$^{**}$</td>
<td>.001</td>
<td>.43</td>
<td>1.95</td>
<td>.18</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PANAS-NA</td>
<td>7.31$^*$</td>
<td>.01</td>
<td>.28</td>
<td>&lt;0.01</td>
<td>.99</td>
<td>&lt;.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>EAC</td>
<td>4.73$^*$</td>
<td>.04</td>
<td>.20</td>
<td>9.44$^{**}$</td>
<td>.006</td>
<td>.33</td>
<td></td>
</tr>
</tbody>
</table>

Note. $n = 29$. Within Effects = effect of covariate from pre- to post-intervention within an experimental group; Between Effects = effect of covariate collapsed across time between experimental groups; TAS = Toronto Alexithymia Scale; ARAS-DA = Attentional Resource Allocation Scale, dissociative amnesia subscale; ARAS-AD = Attentional Resource Allocation Scale, attentional dissociation subscale; ARAS-A = Attentional Resource Allocation Scale, absorption subscale; PANAS-NA = Positive and Negative Affect Schedule, negative subscale; EEQ = Emotional Expressiveness Questionnaire; AEQ = Ambivalence over Emotional Expressiveness Questionnaire; EAC = Emotional Approach Coping.

* $p < .05$, two-tailed. ** $p < .01$, two-tailed.
covariate on PCL-5 scores in the present model. The presence of a learning disability and TAS, ARAS-AD, ARAS-DA, and PANAS-NA scores all had statistically significant effects ($p \leq .04$) on pre- to post-intervention PCL-5 scores, while ARAS-DA and EAC scores had statistically significant effects ($p \leq .046$) on PCL-5 scores based on participants’ group assignment. All other covariates were non-significant ($p \geq .06$).

Thus, the presence of a learning disability and several emotional engagement factors influenced the observed changes in PTSD symptoms. Figure 4 shows how PCL-5 scores changed in time (i.e., pre- to post-intervention) between groups (i.e., EW hand-written, EW typed, control hand-written, control typed) once covariates were considered. When covariates were considered, participants in the EW hand-written condition had increases in PCL-5 scores from pre-intervention ($M = 52.51, SD = 4.66, 95\% \text{ CI} [42.58, 62.43]$) to post-intervention ($M = 57.23, SD = 4.04, 95\% \text{ CI} [48.62, 65.83]$), while PCL-5 scores declined from pre-intervention ($M = 46.42, SD = 6.01, 95\% \text{ CI} [33.61, 59.24]$) to post-intervention ($M = 39.80, SD = 5.22, 95\% \text{ CI} [28.68, 50.92]$) in those who typed EW.

Participants completing either control condition declined in PCL-5 scores from pre-intervention (Hand-written: $M = 56.41, SD = 5.24, 95\% \text{ CI} [45.24, 67.58]$; Typed: $M = 54.57, SD = 5.12, 95\% \text{ CI} [43.66, 65.48]$) to post-intervention (Hand-written: $M = 44.92, SD = 4.55, 95\% \text{ CI} [35.23, 54.61]$; Typed: $M = 50.74, SD = 4.44, 95\% \text{ CI} [41.28, 60.21]$). Nevertheless, time, $F(1, 15) = 0.09, p = .76$, partial $\eta^2 = .006$, group assignment, $F(3, 15) = 1.55, p = .24$, partial $\eta^2 = .24$, and their interaction, $F(3, 15) = 2.88, p = .07$, partial $\eta^2 = .37$, still produced non-significant effects on pre- to post-intervention PCL-5 scores when the selected covariates were added to the primary ANOVA model. This finding
Figure 4. The effect of time on PCL-5 scores within each experimental condition once covariates were included in the model.

*Note.* EW = expressive writing; HW = hand-written.
reinforces that the interventions did not reduce PTSD symptoms or differ in their effect on symptoms.

Another mixed design ANCOVA was then conducted that included only the significant covariates found above to test how these variables affected PCL-5 scores. In this model, all covariates had statistically significant effects (ps ≤ .04) on pre- to post-intervention PCL-5 scores, while ARAS-DA and EAC scores still had statistically significant effects (ps ≤ .049) on PCL-5 scores based on group assignment. The effect of each covariate on PCL-5 scores is displayed in Table 7. Similar to the previous model, participants in the EW hand-written condition had increases in PCL-5 scores from pre- (M = 52.48, SD = 4.12, 95% CI [43.85, 61.10]) to post-intervention (M = 55.42, SD = 4.01, 95% CI [47.04, 63.81]). Pre- to post-intervention PCL-5 scores declined in the EW typed condition (Pre-intervention: M = 47.60, SD = 5.41, 95% CI [36.28, 58.93]; Post-intervention: M = 39.72, SD = 5.26, 95% CI [28.71, 50.74]), in addition to the hand-written (Pre-intervention: M = 57.35, SD = 4.73, 95% CI [47.44, 67.26]; Post-intervention: M = 47.40, SD = 4.60, 95% CI [37.76, 57.03]) and typed (Pre-intervention: M = 52.89, SD = 4.46, 95% CI [43.55, 62.23]; Post-intervention: M = 50.44, SD = 4.34, 95% CI [41.36, 59.52]) control conditions. Table 8 displays the means and standard deviations of PCL-5 scores based on the interaction between time and group. Time, F(1, 19) = 0.65, p = .43, partial $\eta^2 = .03$, and group assignment, F(3, 19) = 1.29, $p = .31$, partial $\eta^2 = .17$, still had non-significant main effects on pre- to post-intervention PCL-5 scores; although, their interaction was significant, F(3, 19) = 3.17, p = .048, partial $\eta^2 = .33$. Therefore, when the presence of a learning disability and significant emotional engagement factors were considered, the interventions had significantly different effects.
Table 8

Average PCL-5 Scores Based on the Interaction between Time and Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(SE)</td>
<td>95% CI</td>
</tr>
<tr>
<td></td>
<td>LL</td>
<td>UL</td>
</tr>
<tr>
<td>EW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HW Typed</td>
<td>52.48(4.12)</td>
<td>43.85</td>
</tr>
<tr>
<td>HW Typed</td>
<td>47.60(5.41)</td>
<td>36.28</td>
</tr>
<tr>
<td>Typed HW</td>
<td>57.35(4.73)</td>
<td>47.44</td>
</tr>
<tr>
<td>Typed HW</td>
<td>52.89(4.46)</td>
<td>43.55</td>
</tr>
</tbody>
</table>

*Note.* Results reflect scores based on the inclusion of significant covariates. CI = confidence interval; LL = lower limit; UL = upper limit; EW = expressive writing; HW = hand-written.
Figure 5. The effect of time on PCL-5 scores within each experimental condition when significant covariates were only included in the model.

Note. EW = expressive writing; HW = hand-written.
on the observed changes in PTSD symptoms. Figure 5 depicts PCL-5 score change over time between groups when significant covariates were only considered.

4. Discussion

4.1 Investigation Summary

Other researchers have found EW is effective for reducing a myriad of physical and psychological symptom (Frattaroli, 2006; Frisina et al. 2004; Smyth, 1998); however, the research on its efficacy in decreasing PTSD symptoms remains inconclusive in comparison to other physical and psychological conditions (Frattaroli, 2006). Whether EW can be effective in alleviating PTSD symptoms when administered as an intensive (i.e., one day) treatment, regardless of its method of completion, was explored. Individuals with PTSD symptoms hand-writing or typing EW were expected to experience similar symptom benefits, while individuals completing control writing paradigms would not have symptom improvements. Constructs suspected to affect emotional engagement when PTSD populations complete EW were also examined to explore their impact on the efficacy of EW treating PTSD symptoms. Specifically, pre-intervention PTSD symptom severity, alexithymia, dissociation, absorption, negative affect, emotional expression, ambivalence to emotional expression, and emotional approach coping were assessed to determine how these factors may influence the effect of EW on PTSD symptoms.

4.2 Primary Findings

There were two primary hypotheses in the current investigation. Hypotheses 1 and 2 examined whether different writing paradigms and modalities had any statistical or clinical significance on changes in pre- to post-intervention PTSD symptom severity.
Researchers have found that EW does reduce PTSD symptoms (e.g., Sayer et al., 2015); therefore, participants completing an EW writing paradigm, regardless of the writing modality, were expected to have significant declines in PTSD symptoms compared to those completing control writing paradigms. Since previous researchers have not investigated differences in PTSD symptom severity due to the completion of hand-written and typed EW, this finding was expected to add to the current literature.

No experimental group had statistically or clinically significant effects, indicating that the administered interventions had no salient influence on PTSD symptoms. Declines in PTSD symptoms did occur in each experimental group; however, some of these reductions may reflect test-retest accuracy more so than intervention efficacy (Evans, Margison, & Barkham, 1998). Participants hand-writing the control paradigm had the greatest observed changes in PTSD symptoms; the result contrasts expectations that EW, which was expected to alleviate symptoms, would be more effective on symptom reduction than a neutral writing task. Participants in control conditions may have experienced symptom reductions due to expectancy effects. Alternatively, participants in EW conditions may have experienced less symptom changes due to temporary increases in negative affect, which can occur the first time EW is completed (Baikie & Wilhelm, 2005; Frattaroli, 2006; Kellas et al., 2015; Sayer et al., 2015). Researchers have previously theorized that increases in negative affect after completing EW may be an indication of appropriate emotional engagement with the task (Deters & Range, 2003). There was no explicit support demonstrating that increases in negative affect occurred after EW was completed; however, participants in EW conditions had significantly higher self-report ratings of distress after completing the writing tasks compared to those in
control conditions, which suggests there were increases in negative affect. To conclude, there was no empirical support for Hypotheses 1 and 2 in regards to EW, which implies that a single session of EW comprising three 15-minute writing sessions separated by 10 minutes may not be an effective intensive treatment for PTSD symptoms, regardless of the writing method chosen for its completion.

4.3 Secondary Findings

Pre-intervention PTSD symptom severity was one factor expected to influence post-intervention severity (Reddy et al., 2014) and, as expected, pre-intervention scores were related to post-intervention severity. When pre-intervention PTSD symptoms were controlled for, no evidence was found supporting Hypothesis 3 because the experimental condition had no statistically significant effect on post-intervention severity. The results further evidence all intervention conditions as ineffective for improving PTSD symptoms, and contrasts previous results whereby EW reduced PTSD symptoms (e.g., Sayer et al., 2015). If EW can change PTSD symptoms, other factors may attribute to its therapeutic effects.

Other factors expected to influence emotional engagement with the writing tasks themselves were examined to determine whether these constructs impacted the observed changes in PTSD symptoms. The original model tested was consistent with the primary findings as there were no significant intervention effects despite the consideration of emotional engagement factors; however, the relationships were impacted by the presence of a learning disability, alexithymia, attentional dissociation, dissociative amnesia, negative emotionality, and emotional approach coping. When only these constructs were considered in a new model, all factors still influenced pre- to post-intervention symptom
changes; although, symptom changes were also affected by participants’ experimental conditions. The results supported several secondary hypotheses (i.e., Hypotheses 4, 5, 7, and in part Hypothesis 9), suggesting that the efficacy of EW on PTSD symptom reduction may be dependent on how emotionally engaged individuals are during these tasks.

All of the constructs noted above influenced symptom changes within participants in this investigation. The presence of a learning disability may affect how participants’ understand or complete writing tasks and, consequently, impact the effect of EW on PTSD symptoms. Meanwhile, emotional approach coping may influence symptom changes due to the similarity this construct has to EW processes. Emotional approach coping represents the tendency to recognize, explore, understand, and communicate personal emotions. These tendencies are central to the EW procedure; therefore, emotional approach coping may reflect essential components to the therapeutic mechanism of EW. In regards to the examined emotional recognition constructs and negative affect, researchers have already found relationships between PTSD severity and alexithymia (Frewen et al., 2006; McCaslin et al., 2006; Søndergaard & Theorell, 2004), dissociation (Ozer et al., 2003), and negative affect (Parslow et al., 2006; Shapinsky et al., 2005), and the present results concur with these findings. Given the consistent associations between PTSD severity and alexithymia, dissociation, and negative affect evident here and in past findings, these constructs appear to have unique relationships and perhaps are salient factors to the presence of PTSD symptoms themselves. Furthermore, different dissociative constructs (i.e., dissociative amnesia and attentional dissociation) seem to have distinct influences on PTSD symptoms, which should be acknowledged in
future investigations. To conclude, learning disabilities and emotional dispositions can be imperative to the efficacy of writing interventions on PTSD symptom severity; but, the mechanism of these relationships should continue to be monitored and clarified.

Despite all factors in the final model affecting symptom changes themselves, dissociative amnesia and emotional approach coping were the only constructs that contributed to symptom differences between groups. Dissociative amnesia may have a greater influence on the amount of content written about past trauma when EW is completed than when writing about events of the present day. As a result, those completing EW with greater dissociative amnesia may write less about their trauma and, consequently, experience less of an effect and symptom change. Meanwhile, participants more prone to emotional approach coping may reflect more on affective states when completing writing paradigms, even if they are asked to objectively identify what they did that day. Symptom changes may then be attributed to the affective state the writing tasks elicit, which presumably differs between EW and neutral writing tasks. Thus, dissociative and coping constructs can influence how different writing tasks affect PTSD symptoms and should be considered when writing interventions are being implemented into treatment.

There was no evidence that emotional expression, ambivalence over emotional expression, or absorption had any effects on PTSD symptoms. Despite emotional expressiveness and ambivalence over emotional expression being previously associated with psychological symptom improvements when EW is completed (Hoyt & Yeater, 2011; Lu & Stanton, 2009; Niles et al., 2014), these factors did not affect EW efficacy on PTSD symptoms in this investigation; however, there were concerns with the internal
consistency of the measure used to assess emotional expression in the present investigation, potentially contributing to the lack of significant results. Absorption also did not impact the observed changes in PTSD symptoms, which may simply be due to no relationship being present. The result accords with the literature, as a stable relationship between the presence of PTSD symptoms and absorption has not been found (Elsesser et al., 2005; Naim et al., 2014). Despite the non-significant effects, researchers should continue examining these relationships using larger sample sizes and dependable measures due to the concerns raised over the reliability of these results.

The debriefing responses revealed some distinctions amongst participants’ reactions to the writing tasks. Typing EW was more distressing than typing the control paradigm, which is explicable given their differences in content. The disparity was not replicated amongst the hand-written groups. The difference may be attributed to hand-writing being more cognitively demanding than typing (Mueller & Oppenheimer, 2014) and thereby more challenging for participants regardless of the writing topic. Difficulty with the writing tasks themselves also varied despite individual group comparisons revealing no differences. Writing paradigms and modalities may then differ in difficulty; however, the disparities may not be apparent when individual groups are compared alone. Participants also found the writing tasks equally helpful, which was unexpected given the control writing paradigm was intended to be a neutral writing task. The results may be attributed to participants expecting their assigned writing task to improve their PTSD symptoms since they were unaware various writing conditions existed in this trial. To conclude, the writing tasks elicited different reactions from participants as intended despite these tasks being subjectively equal in their utility.
In regards to word count, only hand-written and typed control conditions consistently differed amongst the three writing sessions, whereby participants typing wrote more content. The comparison may have been the only significant one due to EW requiring the recall and reflection of traumatic events, which may have made it difficult for participants to continuously write during the allotted timeframe regardless of their assigned writing modality. Reflecting on past traumas and developing new insights about these events may have also become more challenging in time and may explain why other group comparisons were only significant in earlier writing sessions. Thus, different writing tasks allow for varying amounts of content to be written as expected; nonetheless, the amount of written content appears related to the writing topic.

4.4 Research Implications and Directions for Future Research

There are relatively few researchers that have examined the efficacy of EW on individuals with suspected or clinical levels of PTSD symptoms. More research in the field is necessary due to the limited and conflicting literature presently available. Evidence from the current investigation adds to the extant literature and reinforces that other factors (e.g., predispositions) must be examined in EW research before EW is dismissed as a therapeutic intervention for PTSD populations. The efficacy of EW on clinical PTSD populations warrants ongoing investigation with randomized-controlled trials that minimize expectancy effects, which may have influenced the current results. The effect of using different writing methods to complete EW should also be further studied since symptom changes between modalities were not identical and affected the manner in which participants reacted to the writing tasks. Comparing quantitative assessments of EW effectiveness with qualitative research and subjective appraisals of
the effectiveness of EW would be useful as well. Researchers should also use larger samples to better detect potential treatment effects.

Several constructs suspected to influence emotional engagement with EW were collectively explored in this investigation to determine if they affected its efficacy on symptoms when used by individuals with PTSD. Researchers should continue investigating individuals' emotional engagement with EW since emotional engagement with trauma is theorized to be a precursor to habituation (Foa, 1997), and several constructs did affect the symptom changes observed and intervention efficacy. These relationships should be examined in larger PTSD populations and when EW is repeatedly administered over several days, to reduce the chance that increases in negative affect may confound findings, which was thought to occur in the present investigation. The direction of the relationships between emotional engagement constructs and symptom outcomes were also not examined and should be investigated since knowing these effects would be insightful to EW treatment implementation. The relationship between negative affect and attentional dissociation should also be further explored to determine how such factors influence PTSD symptom presentation. Finally, researchers should continue investigating the maintenance of PTSD symptoms pre- to post-EW to clarify how this procedure can be modified to improve symptom reductions.

4.5 Clinical and Practical Implications

Individuals completing EW did not have the anticipated declines in PTSD symptoms in this investigation, potentially due to increases in negative affect that did not decline with repeated administrations of EW in one day. Rises in negative affect may signify that there was emotional engagement, a suspected precursor to habituation, with
trauma, a day-intensive treatment of EW may not be sufficient to allow for this entire process to occur. Clinicians using EW in treatment plans should then administer this procedure over several days based on the current findings and recommendations of others who claim days between writing sessions can allow for greater processing (Frattaroli, 2006). Further, utilizing different writing formats based on the preference of the individual should be considered when implementing EW.

Several factors suspected to impact emotional engagement with the writing tasks influenced their efficacy on PTSD symptoms and should be considered as well when EW is utilized. Clinicians should be aware of the presence of a learning disability before administering EW to clients, as additional assistance completing the task appropriately may be necessary. EW may also only be useful if or when individuals are willing to acknowledge and discuss their emotions pertaining to their traumatic experiences based on the significance of dissociative amnesia and emotional approach coping on symptom outcomes in the trial. Perhaps EW can be used as a tool to help individuals become more inclined with identifying and exploring their emotions that relate to their trauma and, accordingly, enable greater emotional processing and habituation to occur in time.

4.6 Limitations

There are several limitations in the present investigation that warrant consideration. There may be some concern about the generalizability of the findings due to participants not being clinically diagnosed with PTSD and the low number of males in the current sample. The measure used to assess PTSD symptoms in the present investigation has strong psychometric properties and is recognized to provide a provisional PTSD diagnosis (Weathers et al., 2013); therefore, participants in the present investigation
likely possessed symptoms that characterize clinical PTSD. Few males participated in this trial, but previous researchers have found EW outcomes do not typically differ between males and females (Frattaroli, 2006; Sayer, 2015). Accordingly, the current results probably generalize to PTSD populations.

Writing samples were not viewed or analyzed in the current investigation; therefore, there is a chance participants may not have followed their writing instructions as directed. Several researchers have studied participants’ written content when completing EW, which should continue to be monitored for two reasons: 1) to verify EW is being performed as expected, and 2) to analyze the type and degree of processing occurring. The present results can then be used in conjunction with self-report evaluations of emotional engagement to consolidate how individuals are engaging with writing interventions.

A follow-up measure was included in the present protocol; however, there were few respondents to the survey. The lack of responses made analysis of the data collected at this time point ineffective. PTSD is characterized by symptoms that require evaluation of real-world interactions (i.e., avoidance and hyperarousal symptoms); therefore, the post-intervention assessment of PTSD symptoms in this investigation may not have accurately reflected the effects the writing interventions had on symptoms. The concern makes the inclusion of a follow-up assessment to examine the short-term effects of the intervention on PTSD symptoms critical. In addition, a follow-up measure could have confirmed whether additional symptom reductions occurred after participants distanced themselves from the intervention, which would have been useful if negative affect, and possibly PTSD symptom ratings (Frattaroli, 2006), were elevated post-intervention.
Forthcoming investigations of EW should then continue to include follow-up measures as this information is vital in assessing the short-term and longitudinal effects writing treatments have on PTSD symptoms.

Another limitation was the sole use of self-report assessments and the fact that one measure (i.e., EEQ) did not have sound internal consistency in the present investigation. The measure may have then not accurately represented the intended construct and, consequently, may have led to inaccurate evaluations of the examined relationships. Researchers should consider using various measures (i.e., clinical and physiological measures, various self-report questionnaires to corroborate similar constructs) in future studies to obtain and ensure reliable assessments of the factors being investigated.

The sample size in the present investigation was also small, which may increase the Type II error rate in the results and reduce power. In an attempt to provide some context to the results effect sizes were produced when possible. Replication of the above results in larger samples is still necessary to increase power and obtain robust findings.

4.7 Conclusion

Several treatments are consistently effective in relieving PTSD symptoms; in contrast, EW evidence has not been as robust. Whether EW is helpful in reducing PTSD symptoms for the purpose of identifying a brief and cost-effective treatment option was examined. An intensive session of EW had little improvements on PTSD symptoms, regardless of the writing modality used for its completion. Unexpectedly, objectively reflecting on daily activities produced similar symptom reductions as EW. The effects of the administered writing tasks and PTSD symptom changes were affected by the presence of a learning disability and several internal predispositions; that said, further exploration
and consideration of such elements should inform how to effectively utilize EW as an intervention for PTSD.
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6. Appendices

Appendix A: Research Ethics Board Certificate of Approval

Research Ethics Board
Certificate of Approval

PRINCIPAL INVESTIGATOR: Christina Alessandra D'Ambrizio
DEPARTMENT: Psychology

SUPERVISOR: Dr. Gordon J. G. Asmundson - Psychology
FUNDER: Internally Funded - Faculty of Graduate Studies and Research

TITLE: The Therapeutic Benefit of Writing for Posttraumatic Symptoms

APPROVAL OF
Application for Behavioural Research ethics review
Appendix A – Recruitment Advertisement
Appendix B – Sociodemographics Questionnaire
Appendix C – Traumatic Life Events Questionnaire
Appendix D – PTSD Checklist-S
Appendix E – Expressive Writing Paradigm
Appendix F – Control Writing Paradigm
Appendix G – Positive and Negative Affect Schedule
Appendix H – Toronto Alexithymia Scale
Appendix I – Emotion Expressiveness Questionnaire
Appendix J – Ambivalence Over Emotional Expressiveness Questionnaire
Appendix K – Emotional Approach Coping
Appendix L – Attentional Resource Allocation Scale
Appendix M – Debriefing Script
Appendix N – Letter of Initial Contact
Appendix O – Letter of initial Contact, Notice
Appendix P – Informed Consent Form

APPROVED ON: March 31, 2013
RENEWAL DATE: March 31, 2018

Full Board Meeting [ ] Delegated Review [ ]

CERTIFICATION
The University of Regina Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol, consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for research ethics board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion.

Please refer to the following website for further instructions: http://www.uregina.ca/research/REB/main.shtml

Dr. Larena Hoeber, Chair
University of Regina
Research Ethics Board

Please send all correspondence to: Office for Research, Innovation and Partnership
University of Regina
Research and Innovation Centre 109
Regina, SK S4S 0A2
Telephone: (306) 586-4775 Fax: (306) 586-4893 research.ethics@uregina.ca

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Appendix B: Sociodemographics Questionnaire

Please answer the questions below to determine your eligibility for this trial. Please note this trial will require a time commitment of approximately two and a half hours over one week. If you agree to these conditions, please proceed completing the screening questionnaire.

What is your gender? Male ☐ Female ☐ Other ☐ (please specify) __________

What is your date of birth? __________

How did you hear about this study? __________

Which languages you are able to read, write, and understand proficiently? Please check all that apply.

<table>
<thead>
<tr>
<th>Language</th>
<th>Read</th>
<th>Write</th>
<th>Understand</th>
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<tbody>
<tr>
<td>English</td>
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<tr>
<td>French</td>
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<tr>
<td>Other (Please list)</td>
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</table>

Have you ever been diagnosed with a learning disability (i.e., reading or writing)?

YES/NO

Can a detailed message about the trial be left at phone number provided, [PHONE NUMBER LISTED]? YES/NO

Can a message about the trial be sent at the email provided, [EMAIL LISTED]? YES/NO
If no, please list an email where a message can be sent: __________________

Are you willing to use Skype during your participation in this trial? YES/NO

Will you have personal access to a computer for this study? YES/NO

What is your current relationship status? Single/never married  □ Common law/married/civil union  □  Divorced  □  Separated  □  Widowed  □  Prefer not to answer  □

Where do you currently live? Live alone  □  Live with spouse/partner  □  Assisted living (e.g., subsidized living)  □  Long-term care (e.g., retirement home)  □  Other (please specify) _____________  □  Prefer not to answer  □

What is the highest level of education completed? Less than high school  □  High school diploma  □  Associate or technical degree  □  Bachelor’s degree  □  Graduate or professional degree  □  Prefer not to answer  □

Which of the following best describes your current employment status? Please select all that apply:  Employed full-time  □  Employed part-time  □  Looking for work  □  Not looking for work  □  Unable to work  □  (Please specify why) _____________

Disability leave (Long or short term)  □  On temporary leave (e.g., parental) with plans to return to work  □  Homemaker  □  Student  □  Retired  □  Prefer to not answer  □

Please specify your race. If more than one applies, select the race you identify with most strongly.  First Nations  □  Asian  □  Black or African American  □  Hispanic or Latino  □  White or Caucasian  □  Other  □  (Please specify) _____________

Prefer not to answer  □
Appendix C: Traumatic Life Events Questionnaire

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 mark the answers that best describe your experience.

1. Have you ever experienced a natural disaster (a flood, hurricane, earthquake, etc.)?
   Never___ Once___ Twice___ 3 Times___ 4 Times___ 5 Times___ More than 5 Times___
   If this happened:
   Did you experience intense fear, helplessness, or horror when it happened? YES/NO
   Were you seriously injured? YES/NO
   Was someone you cared about or close by seriously injured or killed?
   YES/NO
   Did you think you or a loved one was in danger of being killed by the disaster? YES/NO

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___
   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO
   Were you seriously injured? YES/NO
3. Have you been involved in any other kind of accident where you or someone else was badly hurt? (examples: 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__

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO
   Were you seriously injured? YES/NO

4. Have you lived, worked, or had military service in a war zone? YES/NO
   If yes, were you ever exposed to warfare or combat? (for example: 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__

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO
   Were you seriously injured? YES/NO

5. Have you experienced the sudden and unexpected death of a close friend or loved one?

   Never__ Once__ Twice__ 3 Times__ 4 Times__ 5 Times__ More than 5 Times__

   Due to accident? YES/NO   Illness? YES/NO Suicide? YES/NO
   Murder? YES/NO

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO
6. Has a loved one ever survived a life threatening or permanently disabling accident, assault, or illness? (examples: spinal cord injury, rape, cancer, life threatening virus)

   Never__ Once__ Twice__ 3 Times __ 4 Times__ 5 Times__ More than 5 Times__

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

7. Have you ever had a life threatening illness?

   Never__ Once__ Twice__ 3 Times __ 4 Times__ 5 Times__ More than 5 Times__

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

8. Have you been robbed or been present during a robbery-where the robber(s) used or displayed a weapon?

   Never__ Once__ Twice__ 3 Times __ 4 Times__ 5 Times__ More than 5 Times__

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

   Were you seriously injured? YES/NO

9. Have you ever been hit or beaten up and badly hurt by a stranger or by someone you didn't know very well?

   Never__ Once__ Twice__ 3 Times __ 4 Times__ 5 Times__ More than 5 Times__

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

   Were you seriously injured? YES/NO
10. Have you seen a stranger (or someone you didn't know very well) attack or beat up someone and seriously injure or kill them?
   Never__ Once__ Twice__ 3 Times __ 4 Times__ 5 Times__ More than 5 Times__

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO

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__

   Was the person a: Stranger? YES/NO Friend or acquaintance? YES/NO
   Relative? YES/NO Intimate partner? YES/NO

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO

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__

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO

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 member)
   Never__ Once__ Twice__ 3 Times __ 4 Times__ 5 Times__ More than 5 Times__

   If this happened: Did you experience intense fear, helplessness, or horror when it happened? YES/NO
14. Have you ever been slapped, punched, kicked, beaten up, or otherwise physically hurt by your spouse (or former spouse), a boyfriend/girlfriend, or some other intimate partner?
   Never___ Once___ Twice___ 3 Times___ 4 Times___ 5 Times___ More than 5 Times___

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO
Was you seriously injured? YES/NO
Has more than one intimate partner physically hurt you? YES/NO
If yes, how many hurt you? _____

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 their body in a sexual way?
   Never___ Once___ Twice___ 3 Times___ 4 Times___ 5 Times___ More than 5 Times___

Was the person a: Stranger? YES/NO Friend or acquaintance? YES/NO
Parent or caregiver? YES/NO Other relative? YES/NO
Was threat or force used? YES/NO
Were you seriously injured? YES/NO
Was there oral, anal, or vaginal penetration? YES/NO

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO
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___

Was the person a: Stranger? YES/NO Friend or acquaintance? YES/NO

Relative? YES/NO

Was threat or force used? YES/NO

Were you seriously injured? YES/NO

Was there oral, anal, or vaginal penetration? YES/NO

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

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 their body -against your will or without your consent?

Never___ Once___ Twice___ 3 Times___ 4 Times___ 5 Times___ More than 5 Times___

Was the person a: Stranger? YES/NO Friend or acquaintance? YES/NO

Relative? YES/NO Intimate partner? YES/NO

Was threat or force used? YES/NO

Were you seriously injured? YES/NO

Was there oral, anal, or vaginal penetration? YES/NO

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO
18. **After** your 18th birthday: Did anyone touch sexual parts of your body or make you touch sexual parts of their body - against your will or with out your consent?  

- Never   
- Once  
- Twice  
- 3 Times  
- 4 Times  
- 5 Times  
- More than 5 Times  

Was the person a:  
- Stranger? YES/NO  
- Friend or acquaintance? YES/NO  
- Relative? YES/NO  
- Intimate partner? YES/NO  

Was threat or force used? YES/NO  

Were you seriously injured? YES/NO  

Was there oral, anal, or vaginal penetration? YES/NO  

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO  

19. Were you ever subjected to uninvited or unwanted sexual attention? (other than sexual contact covered by items 15, 16, 17, or 18; examples: touching, cornering, pressure for sexual favours, verbal remarks) YES/NO  

- Never   
- Once  
- Twice  
- 3 Times  
- 4 Times  
- 5 Times  
- More than 5 Times  

Was the person a:  
- Stranger? YES/NO  
- Friend or acquaintance? YES/NO  
- Relative? YES/NO  
- Supervisor/coworker? YES/NO  

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO  

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  

Was the person a:  
- Stranger? YES/NO  
- Friend or acquaintance? YES/NO
Relative? YES/NO  Intimate partner? YES/NO

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

21. Have you or a romantic partner ever had a miscarriage?

Never__ Once__ Twice__ 3 Times__ 4 Times__ 5 Times__ More than 5 Times__

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

Did it (ever) happen after you were physically injured? YES/NO

22. Have you or a romantic partner ever had an abortion?

Never__ Once__ Twice__ 3 Times__ 4 Times__ 5 Times__ More than 5 Times__

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

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 of body parts)

Never__ Once__ Twice__ 3 Times__ 4 Times__ 5 Times__ More than 5 Times__

Please describe:________________________________________________________

____________________________________________________

*If this happened:* Did you experience intense fear, helplessness, or horror when it happened? YES/NO

Were you seriously injured? YES/NO
24. The events listed below correspond to items #1 to #23 on this questionnaire. If any of these events happened to you, CIRCLE the number of the **ONE** event (only 1) that **CAUSES YOU THE MOST DISTRESS**.

| 1. Natural disaster | 9. Assaulted by acquaintance/stranger | 17. As a teen: unwanted sexual contact |
| 2. Motor vehicle accident | 10. Witnessed severe assault to acquaintance/stranger | 18. As an adult: unwanted sexual contact |
| 8. Robbery/weapon used | 16. Before 13: unwanted sexual contact | 24. None of these events happened to me |
(a) When did this event (first) occur? (your age or date):______________________

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

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

<table>
<thead>
<tr>
<th>None</th>
<th>No Distress</th>
<th>Slight Distress</th>
<th>Moderate Distress</th>
<th>Considerable Distress</th>
<th>Extreme Distress</th>
</tr>
</thead>
<tbody>
<tr>
<td>happened to me</td>
<td>Distress</td>
<td>Distress</td>
<td>Distress</td>
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Appendix D: PTSD Checklist – 5

Instructions: This questionnaire asks about problems you may have had after a very stressful experience involving *actual or threatened death, serious injury, or sexual violence*. It could be something that happened to you directly, something you witnessed, or something you learned happened to a close family member or close friend. Some examples are a *serious accident; fire; disaster such as a hurricane, tornado, or earthquake; physical or sexual attack or abuse; war; homicide; or suicide*.

First, please answer a few questions about your *worst event*, which for this questionnaire means the event that currently bothers you the most. This could be one of the examples above or some other very stressful experience. Also, it could be a single event (for example, a car crash) or multiple similar events (for example, multiple stressful events in a war-zone or repeated sexual abuse).

*Briefly identify the worst event (if you feel comfortable doing so):*

___________________________________________________________________

*How long ago did it happen?* _______________ (please estimate if you are not sure)

*Did it involve actual or threatened death, serious injury, or sexual violence?*

_____ Yes

_____ No

*How did you experience it?*

_____ It happened to me directly

_____ I witnessed it
_____ I learned about it happening to a close family member or close friend
_____ I was repeatedly exposed to details about it as part of my job (for example, paramedic, police, military, or other first responder)
_____ Other, please describe ________________________________

If the event involved the death of a close family member or close friend, was it due to some kind of accident or violence, or was it due to natural causes?
_____ Accident or violence
_____ Natural causes
_____ Not applicable (the event did not involve the death of a close family member or close friend)

Second, keeping this worst event in mind, read each of the problems on the next page and then circle one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

<table>
<thead>
<tr>
<th>In the past month, how much were you bothered by:</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</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>the stressful experience?</td>
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<td>2.</td>
<td>Repeated, disturbing dreams of the stressful experience?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>3.</td>
<td>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>
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<td>4.</td>
<td>Feeling very upset when something</td>
<td>0</td>
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<td>2</td>
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<td>5.</td>
<td>Having strong physical reactions when something reminded you of the stressful experience <em>(for example, heart pounding, trouble breathing, sweating)</em>?</td>
<td>0</td>
<td>1</td>
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<td>3</td>
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<td>6.</td>
<td>Avoiding memories, thoughts, or</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td></td>
<td>feelings related to the stressful experience?</td>
<td>0</td>
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<tr>
<td>7.</td>
<td>Avoiding external reminders of the stressful experience <em>(for example, people, places, conversations, activities, objects, or situations)</em>?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>8.</td>
<td>Trouble remembering important parts of the stressful experience</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</tbody>
</table>
(for some reason besides a head injury or alcohol or drug use)?

<p>| 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 | 0 | 1 | 2 | 3 | 4 |</p>
<table>
<thead>
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<td><strong>trusted, the</strong></td>
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<td><strong>world is completely dangerous)</strong>?</td>
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<tr>
<td><strong>10. Blaming yourself or someone else (who didn’t directly cause the event or actually harm you) for the stressful experience or what happened after it?</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
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<td><strong>11. Having strong negative feelings such as fear, horror, anger,</strong></td>
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<tr>
<td>107</td>
<td>guilt, or shame?</td>
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<td>12. Loss of interest in activities that you used to enjoy?</td>
<td>0</td>
<td>1</td>
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<td></td>
<td>13. Feeling distant or cut off from other people?</td>
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<td>14. Having trouble experiencing positive feelings <em>(for example, being unable to feel happiness or have loving feelings for)</em></td>
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<td>people close to you?</td>
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<td>15. Feeling irritable or angry or acting aggressively?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<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>
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<td>4</td>
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<td>17. Being “superalert” or watchful or on guard?</td>
<td>0</td>
<td>1</td>
<td>2</td>
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<td>4</td>
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<td>18. Feeling jumpy or easily startled?</td>
<td>0</td>
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<td>2</td>
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<tr>
<td>Question</td>
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<td>19. Having difficulty concentrating?</td>
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<td>20. Trouble falling or staying asleep?</td>
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</table>
Appendix E: Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale to record your answers.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very slightly</td>
<td>A little</td>
<td>Moderately</td>
<td>Quite a bit</td>
<td>Extremely</td>
</tr>
</tbody>
</table>

_____ interested  
_____ distressed  
_____ excited  
_____ upset  
_____ strong  
_____ guilty  
_____ scared  
_____ hostile  
_____ enthusiastic  
_____ proud  

_____ irritable  
_____ alert  
_____ ashamed  
_____ inspired  
_____ nervous  
_____ determined  
_____ attentive  
_____ jittery  
_____ active  
_____ afraid
Appendix F: Toronto Alexithymia Scale

Please respond to the following statements by indicating how much you agree that they describe you, according to the scale:

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Moderately disagree</th>
<th>Neither disagree</th>
<th>Moderately agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</table>

___ 1. I am often confused about what emotion I am feeling.
___ 2. It is difficult for me to find the right words for my feelings.
___ 3. I have physical sensations that even doctors don’t understand.
___ 4. I am able to describe my feelings easily.
___ 5. I prefer to analyze problems rather than just describe them.
___ 6. When I am upset I don’t know if I am sad, frightened, or angry.
___ 7. I am often puzzled by sensations in my body.
___ 8. I prefer to just let things happen rather than to understand why they turned out that way.
___ 9. I have feelings that I can’t quite identify.
___ 10. Being in touch with emotions is essential.
___ 11. I find it hard to describe how I feel about people.
___ 12. People tell me to describe my feelings more.
___ 13. I don’t know what’s going on inside me.
___ 14. I often don’t know why I am angry.
___ 15. I prefer talking to people about their daily activities rather than their feelings.
16. I prefer to watch “light” entertainment shows rather than psychological dramas.

17. It is difficult for me to reveal my innermost feelings, even to close friends.

18. I can feel close to someone, even in moments of silence.

19. I find examination of my feelings useful in solving personal problems.

20. Looking for hidden meanings in movies or plays distracts from their enjoyment.
Appendix G: Emotional Expression Questionnaire

Please rate the following statements using the scale below:

1                2                3                4                5                6                7
Do not Disagree Somewhat Neutral Somewhat Agree Strongly
agree at all disagree agree agree

1. ____ I often tell people that I love them.
2. ____ When I am angry people around me usually know.
3. ____ I often touch friends during conversations.
4. ____ I laugh a lot.
5. ____ People can tell from my facial expressions how I am feeling.
6. ____ Whenever people do nice things for me, I feel “put on the spot” and have trouble expressing my gratitude.
7. ____ When I really like someone they know it.
8. ____ I apologize when I have done something wrong.
9. ____ Watching television or reading a book can make me laugh out loud.
10. ____ If someone makes me angry in a public place, I will “cause a scene”.
11. ____ I often laugh so hard that my eyes water or my sides ache.
12. ____ If a friend surprised me with a gift, I wouldn’t know how to react.
13. ____ When I am alone, I can make myself laugh by remembering something from the past.
14. ____ I always express disappointment when things don’t go as I’d like them to.
15. ____ My laugh is soft and subdued.
16. ____ I show that I like someone by hugging or touching that person.
Appendix H: Ambivalence over Emotional Expressiveness Questionnaire

Instructions: Respond to the following statements by indicating how frequently the statements apply to you, based on the scale listed below.

<table>
<thead>
<tr>
<th>I have never felt like this</th>
<th>I rarely feel like this</th>
<th>I sometimes feel like this</th>
<th>I often feel like this</th>
<th>I frequently feel like this</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
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___ 1. I want to express my emotions honestly but I am afraid that it may cause me embarrassment or hurt.

___ 2. I try to control my jealousy concerning my boyfriend/girlfriend even though I want to let them know I'm hurting.

___ 3. I make an effort to control my temper at all times even though I'd like to act on these feelings at times

___ 4. I try to avoid sulking even when I feel like it.

___ 5. When I am really proud of something I accomplish I want to tell someone, but I fear I will be thought of as conceited.

___ 6. I would like to express my affection more physically but I am afraid others will get the wrong impression.

___ 7. I try not to worry others, even though sometimes they should know the truth.

___ 8. Often I'd like to show others how I feel, but something seems to be holding me back.

___ 9. I strive to keep a smile on my face in order to convince others I am happier than I really am.
10. I try to keep my deepest fears and feelings hidden, but at times I'd like to open up to others.

11. I'd like to talk about my problems with others, but at times I just can't.

12. When someone bothers me, I try to appear indifferent even though I'd like to tell them how I feel.

13. I try to refrain from getting angry at my parents even though I want to at times.

14. I try to show people I love them, although at times I am afraid that it may make me appear weak or too sensitive.

15. I try to apologize when I have done something wrong but I worry that I will be perceived as incompetent.

16. I think about acting when I am angry but I try not to.

17. Often I find that I am not able to tell others how much they really mean to me.

18. I want to tell someone when I love them, but it is difficult to find the right words.

19. I would like to express my disappointment when things don't go as well as planned, but I don't want to appear vulnerable.

20. I can recall a time when I wish that I had told someone how much I really cared about them.

21. I try to hide my negative feelings around others, even though I am not being fair to those close to me.

22. I would like to be more spontaneous in my emotional reactions but I just can't seem to do it.

23. I try to suppress my anger, but I would like other people to know how I feel.
24. It is hard to find the right words to indicate to others what I am really feeling.

25. I worry that if I express negative emotions such as fear and anger, other people will not approve of me.

26. I feel guilty after I have expressed anger to someone.

27. I often cannot bring myself to express what I am really feeling.

28. After I express anger at someone, it bothers me for a long time.
Appendix I: Emotional Approach Coping

We are interested in how people respond when they confront stressful experiences. By “stressful” we mean situations that are difficult or troubling to you, either because they upset you or because it takes considerable effort to deal with them. There are many ways to deal with stress. This questionnaire asks you to indicate what you generally do, feel, and think when you experience stressful situations. Obviously, different experiences may bring out different responses, but think about what you usually do when you are under a lot of stress.

I usually don’t do this at all  I usually do this a little bit  I usually do this a medium amount  I usually do this a lot

1  2  3  4

___ 1. I take the time to figure out what I’m really feeling.
___ 2. I delve into my feelings to get a thorough understanding of them.
___ 3. I realize that my feelings are valid and important.
___ 4. I acknowledge my emotions.
___ 5. I let my feelings come out freely.
___ 6. I take time to express my emotions.
___ 7. I allow myself to express my emotions.
___ 8. I feel free to express my emotions.
Appendix J: Attentional Resource Allocation Scale

The following consists of questions about experiences that you may have in your daily life. We are interested in how often you have these experiences. It is important, however, that your answers show how often these experiences happen to you when you are not under the influence of alcohol or drugs. To answer the questions, please determine to what degree the experience described in the question applies to you and select the most appropriate rating on the scale, never, rarely, sometimes, often, or always.

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<tr>
<th></th>
<th>Not at all</th>
<th>A little bit</th>
<th>Moderately</th>
<th>Quite a bit</th>
<th>Extremely</th>
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<tbody>
<tr>
<td>1. When I listen to music I can get so caught up in it that I don't notice anything else.</td>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>2. I find evidence that I have done things that I do not remember doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. When listening to organ music</td>
<td>0</td>
<td>1</td>
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or other powerful music. I sometimes feel as if I am being lifted into the air.

4. I sometimes sit staring off into space, thinking of nothing, and am not aware of the passage of time.

5. Listening to someone talk and suddenly realizing that I did not hear all or part of what was said.

6. I find that when I am watching

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television or a movie I become so absorbed in the story that I am unaware of other events happening around me.

<table>
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<tr>
<th>7. The experience of being in a familiar place but finding it strange and unfamiliar.</th>
<th>0</th>
<th>1</th>
<th>2</th>
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<th>4</th>
</tr>
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<tbody>
<tr>
<td>8. The experience of finding myself in a place and having no idea how I got there.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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9. The sound of a voice can be so fascinating to me that I can just go on listening to it.

10. It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily altered.

11. The experience of feeling that
other people, objects, and the world around me are not real.

<table>
<thead>
<tr>
<th>12. If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
</table>

| 13. The experience of feeling as though I am standing next to myself or watching myself do something as if I were looking | 0 | 1 | 2 | 3 | 4 |
at another person.

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<tr>
<th>14. The experience of driving a car and suddenly realizing that I don't remember what has happened during all or part of the trip.</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<th>15. I am able to wander off into my thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
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that I have completed it.
Appendix K: Expressive Writing Paradigm

What I would like you to write about for these next three sessions is your most stressful or traumatic experience. In your writing, I want you to really let go and explore your very deepest feelings and thoughts about the stressful experience. Remember that you have three days to write. You might tie your experience to other parts of your life. How is the experience related to your childhood, your parents, people you love, who you are, or who you want to be? Please write continuously for the entire time, and don’t worry about grammar, spelling, or sentence structure.
Appendix L: Control Writing Paradigm

What I would like you to write about over the next three sessions is how you use your time. In your writing, I want you to be as objective as possible. 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. I want you to describe what you did today from the time you got up until now. For example, you might start when your alarm went off and you got out of bed. You could include the things you ate, where you went, which buildings or objects you passed by as you walked from place to place. Please write continuously for the entire time, and don’t worry about grammar, spelling, or sentence structure.