

**Expressive Writing Moderated by DSM-5 Stressor Criterion A: Introducing a 100-Minute Protocol for Adjustment to Potentially Traumatic Events Regardless of Stressor Type**

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### Abstract

Expressive writing (EW) studies report mixed effects in reducing symptoms related to traumatic and other serious stressors. The present study tested a new intervention, Brief Trauma Organizer (BTO), designed to mitigate theorized moderators of EW effectiveness (i.e., avoidance, rumination, and alexithymia). The primary outcome assessed was symptoms of posttraumatic stress disorder (PTSD). BTO was tested through a non-inferiority randomized control trial with EW as the active control. Participants ( $N = 83$ ) were undergraduates who endorsed a stressor on the Life Events Checklist and a score above the cutoff on the PTSD Symptom Checklist (PCL). Interventions were delivered in a single 2-hour visit. Linear mixed-effects modeling (LMM) showed significant comparable reductions in symptoms at 14-day post-treatment ( $d_{EW} = -0.74$ ,  $d_{BTO} = -0.96$ ), largely maintained at 30-day follow-up ( $d_{EW} = -0.62$ ,  $d_{BTO} = -0.83$ ). Secondary analyses showed large differences at follow-up ( $d = 1.26$ ) among those whose stressor did not meet DSM-5 Criterion A for PTSD ( $d_{EW} = 0.21$ ;  $d_{BTO} = -1.05$ ). Results were comparable among those without PTSD who reported a Criterion A stressor ( $d_{EW} = -0.61$ ,  $d_{BTO} = -0.73$ ), and those meeting all PTSD criteria ( $d_{EW} = -1.64$ ,  $d_{BTO} = -1.38$ ). Rumination predicted meeting full PTSD criteria.

**Keywords:** PTSD, expressive writing, brief treatment, exposure, adjustment disorder

The purposes of this article are, a) to briefly review and synthesize evidence from expressive writing (EW) and posttraumatic stress disorder (PTSD) treatment studies that suggest avoidance, alexithymia, and negative rumination are key barriers to recovery from traumatic and other serious life stressors, b) review findings from these and other lines of research that could help mitigate these barriers; c) introduce an intervention designed to incorporate beneficial practices for stressor recovery in a 2-hour single-visit format, and d) report on findings from a non-inferiority randomized control trial in which the new intervention was tested against EW for the reduction of PTSD symptoms.

The *DSM-5* defines a traumatic event as exposure to actual or threatened death, serious injury, or sexual violence through direct experience, witnessing the event in person, learning that the event happened to a close friend or family member, or experiencing repeated or extreme exposure to the aftermath of an event, such as in the case of a first responder (American Psychiatric Association, 2013). By the time people reach 18 years of age, 62% have already experienced at least one potentially traumatic event (PTE; McLaughlin et al., 2013), and across the lifespan estimates are as high as 75-90% (American Psychiatric Association, 2013; Kilpatrick et al., 2013; Mills et al., 2011).

However, only 9.4% of people exposed to a traumatic event develop PTSD (Kilpatrick et al., 2013), and researchers have reported strong predictive relationships between mere exposure to potentially traumatic events (PTEs) and greater healthcare utilization (Gawronski, Kim, & Miller, 2014; Bruce et al., 2001). PTEs are associated with medical conditions such as cardiovascular diseases, diabetes, gastrointestinal disorders, and cancer (Boscarino, 2012; Kendall-Tackett, 2009; Pacella, Hruska, & Delahanty, 2013). In addition, many people experience serious life stressors (SLSs; Gawronski et al., 2014) such as abandonment by a

parent, relationship conflicts, or natural deaths that do not meet the DSM-5 definition of traumatic stressor, yet which also drive increased healthcare utilization. Psychiatric difficulties associated with PTEs and SLSs include adjustment disorders, PTSD, anxiety disorders, depression, substance abuse, suicidality, psychiatric hospitalization, personality disorders, psychoses, and psychosocial problems (Bruce, 2001; Nemeroff et al., 2006; Pennebaker & Chung, 2011; van Winkel, van Nierop, Myin-Germeys, & van Os, 2013). While many people demonstrate great resilience to stressors (Southwick & Charney, 2012), broad exposure to PTEs and SLSs, and high healthcare utilization, suggest many others are not adjusting as well as might be thought. More needs to be done to promote recovery from significant stressors, which requires understanding relationships between stressors, functioning, and recovery.

Mechanisms theorized to be involved in the relationship between PTEs, SLSs, and worse health include: 1) heightened sensitivity to reminders of the stressor, leading to 2) large efforts to achieve homeostasis (increasing “allostatic load”), resulting in 3) depletion of physical, cognitive, and emotional resources, and this leading to 4) lowered immunology to toxins, poor decision-making and/or performance, and disruption in occupational and social functioning (D’Andrea, Sharma, Zelechowski, & Spinazzola, 2011; McEwen & Tucker, 2011). More specifically, ongoing heightened sensitivity (i.e., lack of habituation) to acute and chronic stressors leads to frequent surges in blood pressure and cortisol, which lead to neuronal damage and alteration in the limbic, hippocampal, and other neurological systems (D’Andrea et al., 2011; McEwen & Tucker, 2011). Psychologically, the ongoing perception of stressors as overwhelming not only triggers physical depletions but maladaptive coping in the form of substance use, risky impulsive behaviors, and poor performance and conflict in social, academic, and occupational roles, which are exacerbated in contexts of poverty and conflict-laden relationships (D’Andrea et

al., 2011; McEwen & Tucker, 2011). Thus some researchers emphasize the importance of PTSD symptoms (PTSS) rather than a PTSD diagnosis since intrusive disturbing thoughts and memories, hyperarousal, negative mood and cognitions, and maladaptive avoidance behaviors can occur without full PTSD and drive deteriorations in functioning (Pacella et al., 2013).

Fortunately, there are effective evidence-based psychotherapies (EBPs) for treating PTSD. Two prominent examples are Prolonged Exposure (PE; Foa, Hembree, & Rothbaum, 2007) and Cognitive Processing Therapy (CPT; Resick, Monson, & Chard, 2007). However, these therapies are accessible to relatively few people and require 8-12 sessions of 60-90 minutes each. Even in settings that can provide a full course of PE or CPT, some clinicians decline to offer them; a number of clients do not continue beyond assessment; and 15-50% drop out of the treatment (Eftekhari, 2013; Imel, Laska, Jakupcak, & Simpson, 2013; Kehle-Forbes, Spoont, & Polusny, 2016; Mott et al., 2014).

Unfortunately, no brief evidence-based treatment for PTSD is available for use in short-term inpatient psychiatric or other settings where ongoing visits may not occur. In addition, lack of a Criterion A stressor may be leading to neglect of assessment of PTSS related to SLSs. Given that PTEs and SLSs are often related to the overt problems being treated in inpatient as well as outpatient settings such as suicidality and substance use disorders, opportunities to address potential “roots” of problematic behaviors are being lost by not having brief methods to promote recovery from highly stressful events.

In contrast to multi-month interventions like PE and CPT, EW is a minimally guided practice of writing about one’s most disturbing PTE or SLS. It is typically experienced as 3-5 sessions of 15-30 minutes duration each. Numerous studies and several meta-analyses report benefits superior to controls in reducing physical and mental health symptoms among clinical

and non-clinical populations (Frattaroli, 2006; Frisina, Borod, & Lepore, 2004; Smyth, 1998), including populations with PTSD (Bragdon & Lombardo, 2012; Sloan, Marx, Bovin, Feinstein, & Gallagher, 2012). If findings were consistently positive, EW could be recommended as a low cost intervention in numerous settings. However, at least eight studies have reported EW outcomes as only comparable to controls in lowering symptoms (Earnhardt, Martz, Ballard, & Curtin, 2002; Gallant & Lafreniere, 2003; Kearns, Edwards, Calhoun, & Gidycz, 2010; Kovac & Range, 2002; O'Connor, Allen, & Kaszniak, 2005; Range, Kovac, & Marion, 2000; Schwartz & Drotar, 2004; Sloan, Marx, & Greenberg, 2011), suggesting writing about the trauma itself may not be the critical active element. It may be that mere participation in a study in which one self-identifies as a trauma victim and completes numerous lengthy trauma-related assessments (as found in the above eight studies) has therapeutic benefit. This is congruent with a meta-analysis of trauma-related studies comprising nearly 74,000 participants which found that, despite initial increases in distress, participation was a positive and beneficial experience (Jaffe, DeLillo, Hoffman, Haikalis, & Dykstra, 2015). It also accords with theory on the therapeutic value of “validating” oneself and others (Linehan, 1993) and not minimizing or dismissing stressful experiences.

For nearly three decades researchers have tried to understand why, for whom, and under what conditions EW is most and least effective (Frattaroli, 2006; Frisina, Borod, & Lepore, 2004; Pennebaker & Chung, 2011; Smyth, 1998). Helpful to this process, four research teams have reported detrimental effects from EW (Batten, Follette, Hall, & Palm, 2002; Gidron, Peri, Connolly, & Shalev, 1996; Honos-Webb, Harrick, Stiles, & Park, 2000; Rogers, Wilson, Gohm, & Merwin, 2007). Themes that emerge are researcher concerns about: 1) avoidance of trauma memories and related emotions during writing or between sessions, 2) difficulties identifying and

describing emotions (i.e., alexithymia), and 3) rumination on negatively biased cognitions. These hypothesized barriers require closer examination.

### **Hypothesized barriers to EW effectiveness**

**Avoidance.** Detrimental effects from EW have been linked with avoiding engagement with trauma memories and related emotions. Avoidance has been demonstrated by not writing about the trauma until the final session (Honos-Webb et al., 2000); actively suppressing or avoiding thoughts or emotions during or after the intervention (Rogers et al., 2007); non-disclosure of the trauma to others (Rogers et al., 2007); and exclusively focusing on insights gained (Batten et al., 2002) or peace achieved regarding the event (Honos-Webb et al., 2000) instead of writing about the trauma itself. In addition, Wisco, Marx, and Sloan (2013) found that, while “positive reappraisal” (i.e., creating a positive meaning for what happened) was helpful for an EW control group (writing about neutral topics), within the EW experimental condition it was associated with less symptom reduction. At first glance the last three observations appear to contradict findings that EW benefits are associated with increases in insight and understanding (Pennebaker, Mayne, & Francis, 1997). However, whereas Honos-Webb et al. (2000) reported a static focus on positivity across essays and termed the practice “sugarcoating,” which may be a risk of premature positive reappraisal, Pennebaker and colleagues observed a dynamic shift from few words demonstrating insight and understanding in the first essay to many by the final essay, suggesting a progression.

Regarding emotional avoidance and engagement, evidence suggests beneficial EW is associated with a moderate use of negative emotion words in the final essay (Pennebaker et al., 1997), and that writing about emotions alone is not as beneficial as writing about emotions plus the details of the trauma (Pennebaker & Beall, 1986; Sloan, Marx, Epstein, & Lexington, 2007).

Not surprisingly, PE and CPT therapists help patients not to minimize or ignore emotions that come with trauma memories, promote seeing emotions as tolerable, and help clients identify, “sit with”, and await the dissipation of strong emotions. PE (and other CBTs) even train participants to rate “subjective units of distress” (SUDS) before, during, and after exposures so that in-session and between-session reductions and habituation are not only experienced but also consciously acknowledged. These findings and practices suggest that acknowledging emotions in relation to a significant stressor, and observing reductions in related arousal, are potentially helpful in trauma recovery.

Achieving a moderate number of negative emotion words in the final essay can result in two ways: by reduction from a very high number, or by an increase from a very low number in the original essay. The benefits associated with reduction from an extreme number of negative emotions in the first essay is congruent with the Jaycox, Foa, and Morral (1998) finding that PE is most effective with participants who show high initial distress and subsequent habituation across sessions. This is in contrast to participants who maintained either very high (“overengagement”) or very low (“underengagement”) distress across sessions. Both findings are congruent with Rogers et al. (2007) who reported that EW participants who engaged most emotionally during writing sessions also reported high emotional avoidance between sessions, and that this group showed worse functioning at post assessment. While persistent high engagement with negative emotions is indicative of failure to achieve habituation, persistent low engagement may be indicative of conscious or unconscious avoidance, potentially due to dissociation, a symptom of PTSD, (APA, 2013) or minimization (Honos-Webb et al., 2000), a typical maladaptive cognition (Beck et al., 1987).

Some researchers have theorized that successful engagement with trauma memories and

strong related emotions may require training in *coping skills* to prevent use of maladaptive coping methods (Gidron et al., 1996). Related to this concern, an efficacious 16-session intervention for PTSD was developed called Skills Training in Affect and Interpersonal Regulation (STAIR; Cloitre, Koenen, Cohen, & Han, 2002; Cloitre, Jackson, & Schmidt, 2016). The first eight sessions train participants to identify, monitor, and accept their feelings; to tolerate distress that comes with pursuing valued goals; and to be assertive and more skilled interpersonally. That training is then followed by eight sessions of Narrative Therapy that is similar to PE. Reported effect sizes are large for PTSD and depression symptoms.

However, in contrast to that comprehensive skills-training approach, Sloan and colleagues (2012) tested a 5-session EW protocol modified to include 25 minutes of psychoeducation about PTSS and a basic tenet of acceptance- and mindfulness-based therapies (Hayes et al., 1999). Participants are taught (and reminded after each session) to allow rather than avoid trauma memories and feelings during and outside of sessions. The researchers reported a large effect size for PTSS and sustained remission at 3- and 6-month follow-ups. This extremely brief education about “between session allowance” may have been sufficient to reduce emotional avoidance between sessions.

Of course, as helpful as overt teaching of acceptance and other skilled responses to distress may be, setting factors alone may also help increase or reduce avoidance. Bragdon and Lombardo (2012) did not add any skills training when they administered a basic EW protocol in an inpatient setting. Participants had comorbid PTSD and a substance use disorder and the basic EW protocol was administered with clearly delineated start and stop times and administration in a private office, without the administrator remaining in the room. The researchers reported substantial post-treatment effect sizes and medium effect sizes at 3-month follow-up. Many EW

studies are conducted in a similar manner, though some have participants do their writing at home. It may be that home-based writing is a poor idea for participants with high avoidance tendencies or lack of “coping skills”. In Gidron et al. (1996) the writing was done at home independently after a first visit to the home by researchers. It may be that professional settings and private, limited-duration writing sessions provide important contextual elements that help people tolerate exposure without need of additional skills. This conjecture is congruent with recent theorization (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014) that the benefits of exposure therapies may be due more to conditioning participants to inhibit escape responses than to actually losing fear of stimuli. It may be that people are able to build tolerance for the presence of distressing memories, emotions, and physiological responses in 20-30 minutes when these are normalized and monitored by a professional. However, a further obstacle may come in the form of difficulty identifying and describing the emotions one has experienced.

**Alexithymia.** Alexithymia is generally understood as a trait involving difficulty identifying and describing feelings, and of having a predominantly external rather than internal focus or awareness (Bagby, Taylor, & Parker, 1994). Results with EW have been mixed. Baikie (2008), Paez, Velasco, and Gonzalez (1999), and Solano, Donati, Pecci, Persichetti, and Colaci (2003) reported that EW participants with high alexithymia scores benefitted more than those with low alexithymia scores. Baikie hypothesized that EW offered encouragement and motivation to explore emotional experiences among people who may not ordinarily do so. In contrast, Ashley, O’Connor, and Jones (2011) found that only low alexithymia was predictive of improvements in depression and anxiety following EW, suggesting skills in emotional differentiation had to already be in place for participants to experience symptom improvement.

Unfortunately, none of the above studies assessed for changes in alexithymia after the

intervention. In a modified-PE study (Cloitre et al., 2002), and a CPT study (Monson et al., 2006), researchers found that participants who were high in alexithymia at baseline were less alexithymic at the end of the intervention. Thus, a relationship appears to exist between reducing alexithymia and reducing symptoms of PTSD and trauma-related depression. This is congruent with a review by Kashdan, Barrett, and McKnight (2015), which summarized numerous findings across psychotherapies which suggest that practices of differentiating between various emotions yield mental health benefits; in contrast, people who do not differentiate emotions well are more likely to be overwhelmed and react impulsively and self-destructively. Improving emotional awareness and clarity is basic to many therapies and serves as a foundation of transdiagnostic approaches (Barlow et al., 2004). Nevertheless, while facility for emotional differentiation may be a necessary condition for recovery from trauma, it is likely not sufficient. Further interference may come in the form of unproductive “dwelling” on negative events, emotions, and thoughts without gaining any benefits from that cognitive attention or emotional and physiological responding as suggested by studies on *ruminat*ion.

**Rumination.** Rumination researchers distinguish between positive and negative forms of “turning inward” and “thinking about problems.” Several researchers have noted positive effects of identifying benefits from traumatic experiences (King & Miner, 2002) and the overall experience of posttraumatic growth (Dekel, Ein-Dor, & Solomon, 2012). Yet many people engage in negative rumination or an unhelpful focus on depressive symptoms and their implications (Just & Alloy, 1997), and repeatedly ponder questions that can rarely be resolved; these include asking “why questions” about feelings, events, and perceived mistakes (Watkins, & Baracaia, 2001, 2002). Victims of trauma in particular often experience disturbing cognitions regarding the past, present, and future as all unalterable (Chard, Resick, Monson, & Kattar,

2014), which is consistent with Beck's depressogenic schemas about the self, the world, and the future (Beck et al., 1987). Not surprisingly, negative rumination has been found to exacerbate depression, impair problem solving, and erode social support (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008).

Two EW studies found that negative rumination defined as "brooding" moderated (Sloan, Marx, Epstein, & Dobbs, 2008) and mediated (Gortner, Rude, & Pennebaker, 2006) the effects of EW on depression. In both studies, high brooders at baseline showed greater reductions in depression, and the latter study also assessed brooding at post and found it reduced in those whose depression had reduced. As with Baikie (2008), the researchers concluded that EW helped high negative ruminators to confront and process their experiences and make gains.

However, some participants may have difficulty achieving healthier cognitions without help, and the efficacy of CPT and PE bear testimony to the value of clinicians trained in these techniques providing that help. Based on early exposure work with PTSD, researchers noted that emotions with a large cognitive component such as guilt, blame, shame, and anger could interfere with benefitting from mere exposure (Pitman et al., 1991). Partly to counter this, CPT was developed based on theory (Resick & Schnicke, 1992) that with PTSD, traumatic events are interpreted to either confirm or introduce maladaptive thoughts regarding themes such as safety, control, trust, intimacy, and esteem. Thus, a central focus of CPT is training patients to be aware of their thoughts and to develop skills in "cognitive restructuring" (CR). With PE, the contents of maladaptive thoughts are also challenged but skills for doing so are not made explicit. Under both therapies a clinician might ask a provocative Socratic question based on a statement made by the client (e.g., "So every woman that wears a miniskirt deserves to be raped?"). Both therapists will also help the client reason toward a less depressive belief. But only CPT will call

attention to that process, categorize the original thought into a type of flaw in logic, and provide ideas for at-home undermining of extreme beliefs and prompting more balanced alternatives.

In an effort to address cognitions within the brevity of EW, Kallay, Vaida, Borla, and Opre (2008) compared a traditional EW protocol to one that included brief training in Rational Emotive Behavioral Therapy (REBT; Ellis & Dryden, 1997). Both protocols involved four 20-minute writing sessions, but in the REBT condition sessions were preceded by 10 minutes of discussion about REBT, and followed by home assignments of identifying and challenging “irrational beliefs” in friends and oneself. PTSS were not assessed but both conditions showed significant reductions in depression symptoms. In addition, the REBT participants reported significantly lower hostility scores at post intervention than at baseline, and showed significantly lower anger, confusion, hostility, and negative affect than the traditional EW condition.

Given these benefits from the addition of REBT to EW, achieved in the context of essentially only 2 hours of intervention, other innovative approaches to address potentially ruminative cognitions within the brevity of EW administrations merit development and study. In addition, EW, PE, and CPT were all developed prior to the aggregation of evidence regarding “third wave” cognitive-behavioral practices being used to treat anxiety, mood, and personality disorders. It may be that “mindfulness,” “willingness to experience distress,” and “nonjudgmental acceptance” of internal experiences (Hayes, Strosahl, & Wilson, 1999; Ma & Teasdale, 2004), as well as practices of validation and reducing the inhibition of mourning (Linehan & Dexter-Mazza, 2008) could all be helpful for trauma recovery. The integration of behavioral, cognitive, and third-wave practices has already been successfully demonstrated by an effective transdiagnostic protocol for emotional disorders (Barlow et al., 2010; Barlow, Allen, & Choate, 2004). At least two EW research teams have considered a potential benefit from

incorporating third-wave principles, particularly for between-session behaviors (Rogers et al., 2007; Sloan et al., 2012). As discussed above, the latter team added brief acceptance training and reminders at the close of each session and found large reductions in PTSS with EW. The present study sought to test a brief protocol that incorporates the above findings and principles into a brief intervention.

### **Development of a brief trauma protocol**

A brief protocol was developed that aimed to promote the same degree of exposure as EW while mitigating potential difficulties with avoidance, alexithymia, and negative rumination to achieve larger and more consistent reduction in PTSS. The protocol was designed to be conducted over a single participant visit, partly to be available for use in settings where the opportunity to treat is immediate and follow-up or ongoing therapy might not occur, especially without a prior positive mental health experience marked by notable symptom reduction. This goal was supported by Frattaroli's (2006) meta-analysis of 146 EW studies which found that length of intervals between sessions did not affect outcomes, and two subsequent studies that reported positive effects from writing for only two minutes on two days (Burton & King, 2008), and writing three times within the same hour on a single day (Chung & Pennebaker, 2008).

In terms of number and duration of writing sessions, Frattaroli (2006) reported that protocols with at least three writing periods were more effective than those with fewer than three periods; and that EW protocols involving more than 15 minutes were more effective than those lasting less than 15 minutes, suggesting that longer contact with traumatic memories is better. Thus, it was theorized that three writing sessions could be administered back-to-back with brief breaks in between without detriment. In fact, in terms of patient care, it was theorized that people could obtain benefits within a single day instead of making repeated visits over three days or

three weeks to obtain those benefits. With back-to-back EW then identified as a potential control group, we then sought to design an intervention that could be matched for time yet offer a curriculum of highly directive activities which promote exposure and habituation (i.e., non-avoidance), assistance in verbalizing experiences (i.e., non-alexithymia), and cognitive restructuring and problem-solving (i.e., non-rumination).

Another consideration was whether to reduce dependence on writing itself. Studies had shown that writing trauma narratives was not superior to verbalization to a therapist or tape recorder (Pennebaker, 1997). In addition, the first author had experience in an inpatient setting with older patients who had avoided writing since their schooling days, and others who wrote prolifically but mostly engaged in rumination. Thus, emphasis was placed on achieving a highly structured narrative but not necessarily written. Pen-and-paper worksheets were developed to minimize need of writing complete sentences as well as to “normalize” emotions and thoughts experienced by many trauma victims. This instrument (Brief Trauma Organizer; BTO) was first tested and refined through administration to five undergraduate participants in a pilot study (Alessandri & Christoff, 2014) resulting in the current arrangement of worksheets. Exercises include the following and are administered by a clinician with 5-minute breaks after approximately 30 and 60 minutes:

- 1) Psychoeducation concerning normal physiological and emotional arousal during the perception of significant threat or loss (Barlow et al., 2010), promotion of acceptance (Hayes et al., 1999), and introduction to monitoring arousal level with periodic SUD ratings (which occurs throughout the intervention; Foa et al., 2007);

- 2) Brief experiential familiarity with autonomic responding to cognitions (e.g., imaginal lemon elicits salivation; Hayes et al., 1999);

3) Frequent encouragement to “allow” and “ride out” physiological and emotional arousal that occurs under various types of cues (Barlow et al., 2004; Foa et al., 2007; Resick et al., 2007; Sloan et al., 2012);

4) Exposure to a rich list of negative emotion words for endorsement by patients in relation to the trauma (Pennebaker et al., 1997; Pennebaker & Beall, 1986; Sloan et al., 2007), with feedback by therapist, both to promote normalization, validation, acceptance, and non-minimization of distress as well as desensitization to these potential triggers of arousal (Barlow et al., 2004; Kashdan et al., 2015; Linehan, 1993);

5) Exposure to positive emotion words to promote new perspectives and prime the consideration of posttraumatic growth (Dekel, Ein-Dor, & Solomon, 2012; King & Miner, 2002);

6) Identification of sensory cues for trauma memories to promote imaginal exposure and habituation, followed by encouragement to later seek out *in vivo* exposure to them (Foa et al., 2007);

7) Identification, normalization, and completion of sentence stems with typical ruminative content (e.g., “Why \_\_\_\_?”, “Where was \_\_\_\_ when this was happening?”, “Now I’ll never be able to \_\_\_\_”; Beck et al., 1987; De Jong-Meyer, Beck, & Riede, 2009; Just & Alloy, 1997; Smith, Alloy, & Abramson, 2006; Watkins, & Baracaia, 2001, 2002; Williams, Davis, & Millsap, 2002);

8) Cognitive restructuring of one’s three worst conclusions related to the event (Resick et al., 2007);

9) Very brief assessment of non-disclosure of the trauma to others and assistance in problem-solving to plan who, when, and how to potentially disclose the event to another while also promoting a supportive response (Kao, Dritschel, Astell, 2006; Watkins & Baracaia, 2002);

10) Cognitive restructuring focused on guilt, blame, shame, and anger (Pitman et al., 1991) to achieve understanding and forgiveness (Freedman & Enright, 1996) or broadened locus of responsibility (Resick et al., 2007);

11) Identifying three cognitions showing posttraumatic growth (Dekel, Ein-Dor, & Solomon, 2012);

12) Brief assessment of willingness to experience reminders of the event and likelihood of continued avoidance behaviors, with feedback by the therapist to promote greater acceptance and willingness (Foa et al., 2007; Hayes et al., 1999);

13) Writing or telling an organized account of the event (Pennebaker, 1997) and its aftermath (Resick et al., 2007), using the previous exercises above to describe what occurred with clarity; acknowledge its impact on one's emotions, thoughts, and behaviors including social functioning; identify ongoing cues that may benefit from exposure; identify areas of growth and resilience thus far; and to plan changes in moving forward;

14) Re-endorsement of negative and positive emotion words, with therapist-led discussion about evident changes in perspective (Pennebaker & Stone, 2003);

15) A summary of the experience and of key principles for ongoing acceptance (and non-avoidance) of cues, emotions, and autonomic responding.

Incidentally, the lists of negative and positive emotion words were generated from a longer list of nearly 14,000 words gathered and tested among thousands of participants by Warriner, Kuperman, and Brysbaert (2013) and their research predecessors (Bradley & Lang, 1999). After several waves of paring down the lists to unique and highly valenced descriptors of human experience, words were then grouped according to themes (e.g., surprised, shocked, disbelieving, confused, ambushed, isolated, abandoned, alone, forgotten) for the purposes of

increasing and prolonging arousal, and fostering verbal discrimination. The final lists consist of 171 negative and 210 positive words.

**Hypotheses.** BTO was tested in a randomized control trial (RCT) with EW as an active treatment control condition. Our primary hypothesis was that, in a sample of college students who endorsed a PTE or SLS and a minimum of PTSS, BTO would yield greater reduction in PTSS at 14-day post treatment than EW and these would maintain at 30-day follow-up assessment. Our secondary hypotheses were that PTSS would be at least moderately associated with cognitive avoidance, alexithymia, and negative rumination, and that BTO would yield significantly greater reductions in these measures as compared to EW. We also hypothesized that among those with highest avoidance and negative rumination scores, and who met the cutoff score for alexithymia, BTO would perform better than EW on PTSS reduction. Lastly, we did not initially plan to identify three subgroups related to stressor type and diagnostic criteria for PTSD, but our sample size was sufficient to report preliminary observations.

## Method

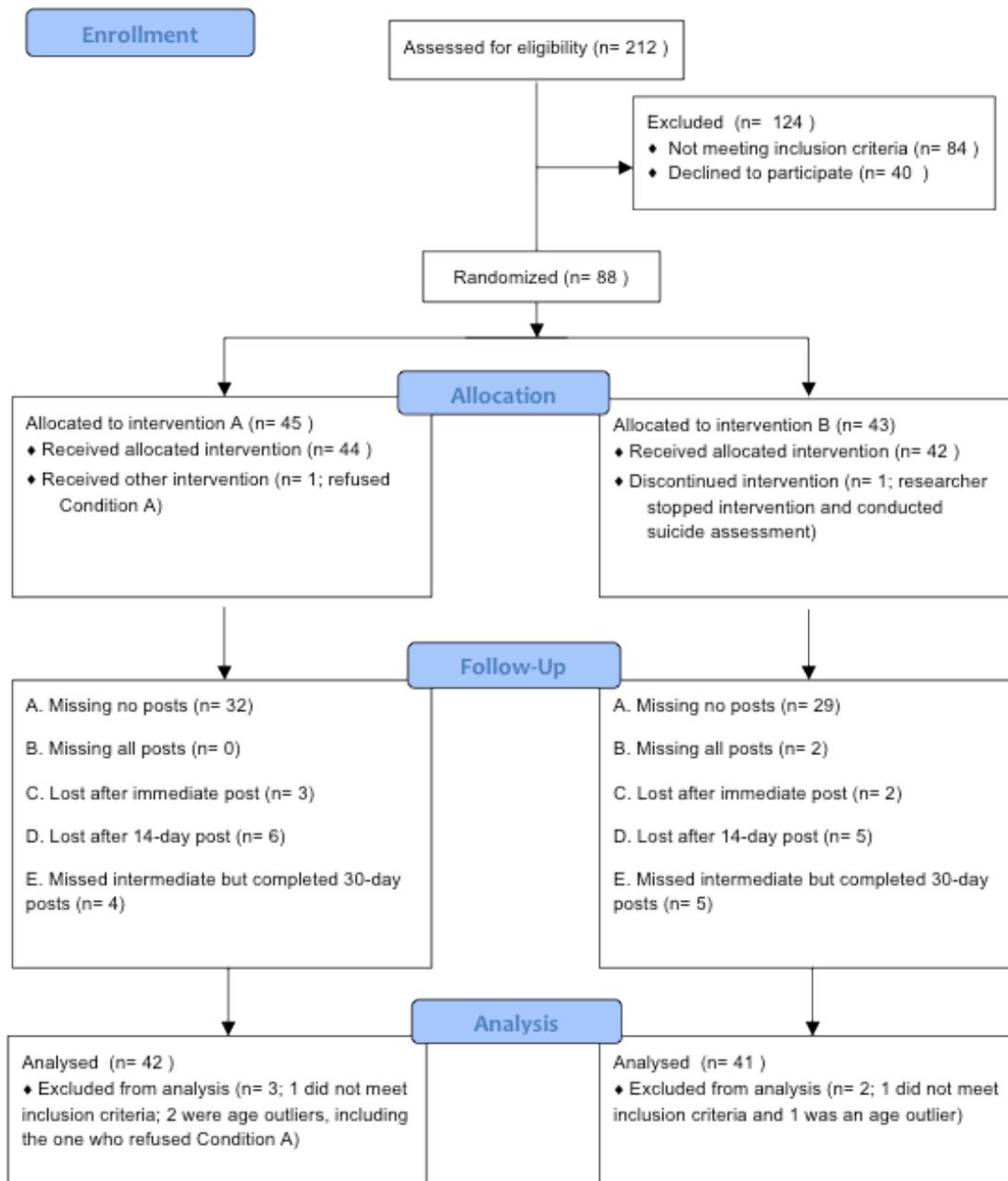
### Participants

Participants were undergraduate students at a large public university in the southern United States. Participants were invited to participate after completing a prescreen battery which consisted of completing a Life Events Checklist (Blake et al., 1990) and a PCL-S (Weathers, Litz, Herman, Huska, & Keane, 1993) with a minimum score of 30 (the suggested cutoff for civilian PTSD; Weathers et al., 1993) in reference to their most disturbing event. Participants received credits that fulfilled research requirements in their psychology courses, and were entered in two drawings to win a \$50 gift card to a vendor of their choosing. A Consort-compliant diagram is provided in Figure 1. Of 212 people screened, a total of 128 were invited to participate, and 88 accepted, were randomized into a treatment condition, and received an intervention. However, six cases require special mention. Based on the inclusion criteria, two should not have received an intervention due to nearly non-existent symptom profiles, and three were outliers for age; their data were not included in the intent-to-treat (ITT) analyses. One administration was terminated prematurely and followed by a safety assessment due to administrator concern regarding suicidal ideations; this case was included in the ITT analyses resulting in 83 cases analyzed.

The resulting sample ( $N = 83$ ) consisted of 66 (80%) women and 17 (20%) men; sixty-three percent were in their first year of college. The mean age was 19.27 ( $SD = 1.36$ ). Using number of rooms in their parents' home as a proxy for socioeconomic status (SES), the mean number reported was 6.91 ( $SD = 2.22$ ,  $Mdn = 7$ ). According to the U.S. Census Bureau (2000), the median for that region of the U.S. is 5.3 rooms, suggesting this sample was above the median in SES. Regarding parental education, 60% said their mother had at least a bachelor's degree and

57% said the same of their father, also suggesting a higher than average SES. The majority self-identified as White/Caucasian (75%), with 15% Black/African-American, 5% Latino/Hispanic, 2% Multiracial, 1% Asian, and 2% Other.

Figure 1. *Flow of Participants Through the Trial.*



Regarding participants' most disturbing events, 62 (75%) reported a DSM-5 Criterion A stressor for PTSD; 45 (54%) did not meet sufficient other symptom cluster criteria for PTSD while 17 (20%) did. The remaining 21 (25%) reported a non-Criterion A stressor. Grouped by type of trauma, the largest subgroup reported sexual violence (22%), followed by a violent or accidental death (19%), abuse as children (12%), physical assault (8%), motor vehicle accidents (7%), and serious injury (7%). One person reported combat exposure, another a natural disaster. Several reported exposure to a natural death (5%) and other disturbing events that did not meet Criterion A (20%) such as terminal illness diagnoses, childhood bullying, criminal accusations, and difficult interpersonal events.

A series of *t*-tests and chi-square tests were used to explore differences in mean baseline scores for all outcome measures. There were no significant differences based on sex or being a racial minority/majority member (all *p*'s > .05). While not statistically significant, it is notable that all 12 African-Americans, both Multiracial participants, and half of the Latinos reported a Criterion A stressor (86% of minorities), while only 71% of Whites did so. Among women, 79% reported a Criterion A stressor; among men this was 59%. One-third of Black participants met Criteria for PTSD, in contrast to only 10% of Whites. By sex, 14% of women met criteria for PTSD, and 12% of men. Despite randomization, participants who received the BTO condition showed a significantly higher SES than EW participants; however, when SES was entered as a covariate in analyses it was not significant and was dropped from analyses; no other variables distinguished the two treatment conditions at baseline.

### **Procedure**

This study was approved by the Institutional Review Board (IRB) of the university where it was conducted. Recruitment and administrations occurred from March to November 2014,

with final 30-day posts completed by January 2015. Participants provided written informed consent during the intervention session and online during a departmental prescreen battery and four assessment batteries (baseline, 24-hours post-intervention, and at 14- and 30-days post).

*Measures. Identification of victims of trauma.* To identify victims of trauma, the Life Events Checklist (LEC; Blake et al., 1990) was administered in the prescreen battery. This measure lists 17 types of traumatic event and asks whether they witnessed or experienced each. Meeting DSM-V criteria for a PTSD stressor was not part of the inclusion criteria although analyses were subsequently organized by PTSD symptom groups.

*PTSD symptoms.* To confirm the inclusion criterion and assess changes in symptom severity, the Modified PTSD Symptoms Scale-Self Report (MPSS-SR) was administered. This instrument was adapted from an earlier instrument by Foa et al. (1993) by Falsetti, Resnick, Resick, and Kilpatrick (1993) to distinguish between *frequency* and *intensity* of symptoms. The 17 items assess the 17 symptoms of PTSD in the DSM-IV-TR (APA, 2000; e.g., “Have you persistently been making efforts to avoid thoughts or feelings associated with the event?” and, “Have you been jumpier, more easily startled, since the event?”). Frequency of each item is scored from 0 (*not at all*) to 3 (*5 or more times per week/ very much/ almost always*). Intensity of each item is scored from 0 (*not at all distressing*) to 4 (*extremely distressing*). Internal consistency of .96 and good concurrent validity with the Structured Clinical Interview for DSM-IV (SCID) have been reported (Falsetti et al., 1993). In the present study, a minimum of 12 points at pre-test was required to confirm inclusion in analyses, and Cronbach alphas ranged from .89 to .93 for both subscales at all four assessment periods.

*Depression symptoms.* To assess changes in depression symptoms, the Depression, Anxiety, and Stress Scale (DASS-21) was administered. This measure was developed first as a

42-item measure, then reduced to 21 items by Lovibond and Lovibond (1995). The initial 42-item measure showed internal consistencies of .84 to .91 for the three subscales. A study by Antony et al. (1998) showed alphas ranging from .92 to .97 for the 42-item version, and .87 to .94 for the DASS-21. In the present study Cronbach alphas ranged from .83 to .93 for the four assessment periods.

*Physical symptoms.* Changes in physical complaints were assessed with the Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker, 1982). This contains 54 items with physical health complaints (e.g., “headaches,” “congested nose,” “coughing”) rated from 0 (*have never or almost never experienced the symptom*) to 4 (*more than once every week*). Internal reliability has been reported with Cronbach alpha coefficients ranging from .88 to .91. Test-retest reliability has been assessed at two months with correlations ranging from .79 to .83 (Kearns et al., 2010). In the present study Cronbach alphas ranged from .95 to .96 for the four assessment periods.

*Thought suppression/avoidance.* Changes in attitudes toward unwanted thoughts were assessed with the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994). This 15-item measure rates statements such as, “There are things I prefer not to think about” and, “I always try to put problems out of mind” on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Reliability has been demonstrated with Cronbach alphas ranging from .87 to .89, and re-test correlations have been .92 at one week and .69 at three months. Correlations with instruments for depression, anxiety, and symptoms of obsessive compulsion disorder support the validity of the WBSI for assessing avoidance of noxious thoughts. In the present study Cronbach alphas ranged from .91 to .94 for the four assessment periods.

*Alexithymia.* The 20-item Toronto Alexithymia Scale (TAS-20; Bagby, Taylor & Parker, 1994; Parker, Taylor, & Bagby, 2003) was used to measure alexithymia. Confirmatory factor analyses have repeatedly demonstrated three factors or subscales assessing, 1) difficulty identifying feelings (DIF; e.g., “I am often confused about what emotion I am feeling”); 2) difficulty describing feelings (DDF; e.g., “It is difficult for me to reveal my innermost feelings, even to close friends”); and, 3) a thinking style that is externally oriented (EOT; e.g., “Looking for hidden meanings in movies or plays distracts from their enjoyment”). Items are rated from 1 (*strongly disagree*) to 5 (*strongly agree*). Published norms suggest individuals with a score of < 52 are not alexithymic; 52-60 suggests possible alexithymia; and 61+ suggests alexithymia; Taylor, Bagby, & Parker, 1997. Total scale internal consistency has been demonstrated as Cronbach’s alpha = .81 with 3-week stability of  $r = .77$  (Bagby, Taylor, & Parker, 1994). In the present study Cronbach alphas for the full scale ranged from .80 to .87 for the four assessment periods.

*Negative rumination.* The tendency to ruminate when sad was assessed with the Ruminative Response Scale (RRS; Nolen-Hoeksema & Morrow, 1991). A study by Treynor, Gonzalez, and Nolen-Hoeksema (2003) aimed at controlling for overlap with the Beck Depression Inventory. It isolated 12 items as a ‘depressive rumination’ subscale (e.g., “Think about all your shortcomings, failings, faults, mistakes”); as well as 5 items for ‘brooding’ (“a passive comparison of one’s current situation with some unachieved standard”; e.g., “Think, What am I doing to deserve this?”), and 5 items for ‘reflection’ (“a purposeful turning inward to engage in cognitive problem solving to alleviate one’s depressive symptoms”; e.g., “Go someplace alone to think about your feelings”). Items are scored from 1 (*almost never*) to 4 (*almost always*). Since one purpose of the present study was to test the role of a negative

ruminative thinking style in potentially interfering with EW, and potentially addressed by BTO, the negative subscales were summed resulting in a ‘negative rumination’ score. The overall scale has demonstrated internal consistency alphas of .89 and .90, with subscale alphas between .72 and .77. Test-retest reliability has been reported as .67. In the present study Cronbach alphas for the four assessment periods for the full scale ranged from .94 to .95, from .79 to .87 for the brooding subscale, and from .92 to .93 for the depressive rumination subscale.

Protocol administrators were two graduate students with master’s degrees in a clinical psychology doctoral program. Randomization to one of the two treatment conditions (EW or BTO) was determined by flipping a coin when participants arrived for the in-person session. Instructions for the EW condition were from Pennebaker and Chung (2011, p. 419). Writing durations were initially 25 minutes but after the first three BTO participants showed sizable variability in treatment duration the EW periods were increased to 30-35 minutes in order to match conditions. Use of a “window” instead of strict timing also allowed for less abrupt termination of exposures. A 5-10 minute break was taken after the first and second writing periods. Instructions were provided in writing to participants and read aloud at the beginning of each writing period. Participants wrote with pen and paper or typed on a computer, according to their preference. The protocol administrator stayed in the room, doing work of their own and requesting SUD ratings at the beginning and end of each writing period, and approximately every seven minutes, to match this aspect of distress monitoring in the BTO condition.

The BTO condition consisted of a therapist administering 12 unique worksheets comprised of exercises described above. Each worksheet began with assessment of current SUD rating, and ended with peak SUD rating for that worksheet. The administrator read all instructions aloud while the participant followed along on their own sheets. Administration

included discussion to ensure the participant understood the instructions and principles, and the protocol provided semi-scripted reactions to participant responses on worksheets to promote completion, normalization, validation, acceptance, and posttraumatic growth throughout.

BTO worksheets 1-4 consisted of brief psychoeducation on arousal and SUD ratings, exercises for identification and exposure to relevant negative and positive emotions, and identification of ruminative cognitions. After a 5-10 minute break, worksheets 5-7 were administered. They consisted of exercises for identifying and challenging one's three worst cognitions related to the trauma; problem-solving regarding disclosure of the trauma to a friend (if never disclosed); cognitive restructuring related to anger, blame, shame, and guilt; and identification of sensory cues with brief imaginal exposure and encouragement to seek repeated *in vivo* exposures to sensory cues outside of session until they weaken as triggers for arousal. After a second break, worksheets 8-12 were administered. They consisted of exercises assessing and promoting willingness to allow unpleasant memories and emotions; writing or telling a comprehensive trauma narrative; re-exposure to the lists of negative and positive emotion words and discussion of changes; a scripted review of the experiences and principles addressed throughout the protocol; and a final prompt to identify a new hopeful cognition or perception.

After each participant completed his or her treatment condition, they were assessed for safety and provided with contact information for local mental health resources. The project supervisor was available by phone for supervision. The one case of early termination case was reported to the IRB as a potentially adverse event and monitored for several weeks.

### **Treatment Equivalence, Consistency, and Fidelity**

Equivalence between conditions, and consistency and fidelity within conditions (Bellg et al., 2004), were promoted through several methods. Equivalence of treatment time was promoted

by administration of both treatments in three consecutive sessions separated by a 5-10 minute break, all but one within a single 2-hour block. In the EW condition, writing periods varied from 30-35 minutes each and total writing time ranged from 87-100 minutes per participant ( $M = 97$ ,  $Mdn = 98$ ). For BTO, total treatment durations ranged from 62 to 142 minutes ( $M = 98$ ,  $Mdn = 95$ ). When entered as a covariate, mean duration was not found to be significant so was dropped from the analyses. Lastly, the researcher remained in the room with the participant under both conditions, and frequent assessment of SUDS ratings provided similar periodic expressions of therapist concern regarding how the participant was feeling.

Consistency and fidelity were promoted by the use of a written protocol for each condition that was also read aloud to participants; the use of administrator checklists regarding procedures; and coding session videotapes for experimenter warmth and clarity, and participant reception/understanding. Three undergraduates blind to the study hypotheses were trained to achieve 90% agreement on the coding instrument. Two Coders reviewed 45 (52%) of the sessions and showed 100% agreement (and the highest possible scores) for administrator clarity and participant receptivity/understanding. Experimenter warmth showed 82% agreement on the highest possible score, with the remaining 18% of cases rated at least 9 out of 12 for warmth by both raters, with differences between raters never exceeding 2 points. This evidence suggests that within each condition participants received very similar and faithful administrations, and between conditions administrations were comparable in terms of duration, participant receptivity, and researcher warmth and clarity.

## Results

### Data preparation

**Missing data.** Five patterns of missingness were logically identified: those with no missing data ( $n = 57$ ); those who only provided a baseline but no posts ( $n = 2$ ); those who completed the 24-hour post but no subsequent posts ( $n = 5$ ); those who missed the final post ( $n = 11$ ); and those who missed an interim post but completed the final post ( $n = 8$ ). A negative correlation was found between missingness and 14-day post score on negative rumination ( $r = -.23, p = .042$ ); thus, data did not appear to be “missing completely at random” (MCAR; Enders, 2010). As rumination was not the primary outcome of interest, the missingness mechanism was treated as “missing at random” (MAR; Rubin, 1976) rather than “not completely at random” (NCAR; Enders, 2010), allowing for use of robust data estimation methods. Multiple Imputation (MI) of 20 datasets using SPSS (v. 20) was used to generate missing scores, with pooled effects reported. MI is a robust method of using regression and properties of normal distributions to predict several likely values for missing scores, which are then “pooled” to derive means and confidence intervals that are less biased than deleting cases with missing data (Enders, 2010).

**Primary intent-to-treat (ITT) analysis.** Linear mixed-effects modeling (LMM) using the MIXED procedure in SPSS (v. 20) was applied to test the hypothesized differences in symptom reduction between conditions. Based on the Likelihood Ratio Test (Enders, 2010; Kline, 2011), the best-fitting model allowed for varied intercepts among participants in addition to fixed effects. Time, treatment condition, and the interaction of time and treatment condition were the fixed effects. Allowing for random intercepts (i.e., unconstrained baseline scores) was significantly more accurate than a fixed-effects-only model, and than a subsequent model

allowing for random slopes as well (i.e., individual rates of symptom change across time). Table 1 summarizes the means, standard errors and effect sizes for all variables.

Using Cohen's recommendations for interpretation of effect sizes (ES; 0.2 = small; 0.5 = medium; 0.8 = large; Cohen, 1988), both conditions showed large but comparable, significant reductions in PTSS at 14-day post, and largely maintained at 30-day follow-up (Table 1). For BTO the mean 30-day PTSD symptom change score was -15.24 (95% CI = -20.87, -9.62); EW change scores showed a mean difference of only 3.87 fewer points of symptom reduction (95% CI = -4.01, 11.75). Since the confidence interval includes zero (i.e., no difference), with EW possibly performing up to 4.01 points better or 11.75 points worse than BTO, the difference is not regarded as statistically or clinically significant.

Table 1. Pooled imputed means at baseline, 14 days, and 30 days, with effect sizes (*small*  $d = 0.2$ , *medium*  $d = 0.5$ , *large*  $d = 0.8$  per Cohen, 1988).

	EW ( $n = 42$ )		BTO ( $n = 41$ )		Pooled $t$ (Cohen's $d$ ) Between
	Mean +/- SE	Pooled $t$ (Cohen's $d$ ) Within	Mean +/- SE	Pooled $t$ (Cohen's $d$ ) Within	
<b>PTSD Symptoms (MPSS-SR)</b>					
Baseline	43.91 +/- 2.96		39.68 +/- 2.99		
14-Day Post	30.35 +/- 2.97	-4.79 (0.74)***	22.06 +/- 3.02	-6.13 (0.96)***	1.01 (0.22)
30-Day Post	32.53 +/- 2.97	-4.03 (0.62)***	24.44 +/- 3.01	-5.31 (0.83)***	0.96 (0.21)
<b>Depression Symptoms (DASS-21)</b>					
Baseline	6.10 +/- 0.72		6.88 +/- 0.73		
14-Day Post	4.82 +/- 0.74	-1.72 (0.27)†	4.16 +/- 0.75	-3.59 (0.56)**	1.35 (0.30)
30-Day Post	5.39 +/- 0.75	-0.94 (0.15)	3.91 +/- 0.74	-3.96 (0.62)***	2.13 (0.47)*
<b>Physical Symptoms (PILL)</b>					
Baseline	70.07 +/- 4.71		70.61 +/- 4.77		
14-Day Post	54.28 +/- 4.73	-3.94 (0.61)***	52.88 +/- 4.79	-4.37 (0.68)***	0.34 (0.07)
30-Day Post	59.84 +/- 4.73	-2.55 (0.39)*	61.59 +/- 4.79	-2.22 (0.35)*	0.21 (0.05)
<b>Thought Avoidance/Suppression (WBSI)</b>					
Baseline	56.93 +/- 1.62		58.83 +/- 1.64		
14-Day Post	52.82 +/- 1.63	-2.52 (0.39)*	47.82 +/- 1.67	-6.59 (1.03)***	2.95 (0.65)**
30-Day Post	54.04 +/- 1.65	-1.76 (0.27)†	51.35 +/- 1.65	-4.53 (0.71)***	1.96 (0.43)†
<b>Alexithymia (TAS-20)</b>					
Baseline	57.17 +/- 1.58		55.20 +/- 1.59		
14-Day Post	56.66 +/- 1.59	-0.36 (0.06)	52.61 +/- 1.62	-1.81 (0.28)†	1.03 (0.23)
30-Day Post	55.19 +/- 1.60	-1.39 (0.21)	51.61 +/- 1.63	-2.48 (0.39)*	0.79 (0.17)
<b>Negative Rumination (RRS)</b>					
Baseline	40.62 +/- 1.74		42.78 +/- 1.77		
14-Day Post	39.51 +/- 1.76	-0.70 (0.11)	36.36 +/- 1.79	-3.96 (0.62)***	2.34 (0.51)*
30-Day Post	39.82 +/- 1.76	-0.50 (0.08)	38.62 +/- 1.79	-2.56 (0.40)*	1.48 (0.32)

MPSS-SR = Modified PTSD Symptoms Scale-Self Report; DASS-21 = Depression, Anxiety, and Stress Scale; PILL = Pennebaker Inventory of Limbic Languidness; WBSI = White Bear Suppression Inventory; TAS-20 = 20-item Toronto Alexithymia Scale; RRS = Ruminative Response Scale; EW = expressive writing; BTO = brief trauma organizer; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , † $p < .10$ .

**Secondary analyses.** While results were comparable between conditions for PTSS, other indicators of well-being showed interesting differences. Only BTO showed significant reduction

in depressive symptoms (Table 1; medium ES), and while initially not significant the difference between conditions was significant at 30-day follow-up (medium ES). Reductions in physical symptoms showed a medium ES at 14-day post for both conditions, but these effects reduced to small ES's for both conditions at 30-day follow-up.

BTO performed significantly better in reducing thought avoidance than EW at 14-day post (Table 1). However, at 30-day follow-up the difference was no longer significant. We also tested whether BTO was more helpful than EW for high initial thought avoiders. We divided participants based on lowest, middle, and highest third of thought avoidance scores, per condition, and LMM procedures were repeated for the high thought avoidance subgroup; there was no significant difference between conditions ( $t_{(\text{pooled})} = 1.74, p = .081$ ). The ES for EW was medium ( $n = 15, t_{(\text{pooled})} = -2.23, d = -0.58, p = .026$ ) while for BTO it was very large ( $n = 16, t_{(\text{pooled})} = -4.82, d = -1.21, p < .001$ ). In terms of movement between cutoff scores, at 30-day follow-up EW showed a 67% reduction in people who met the cutoff for highest thought avoidance and BTO showed a 64% reduction; a 2x2 chi-square test did not detect a significant difference ( $p = .931$ ).

Only BTO achieved a significant albeit small reduction in alexithymia but the difference between conditions was not significant (Table 1). Using the TAS-20 cutoff scores for non-alexithymic, possibly-alexithymic, and alexithymic, BTO saw a 43% decrease in participants in the alexithymic group, and a 19% increase in the no-alexithymia group at 30-day follow-up. EW saw movement in both directions: a 23% increase in those who met the cutoff for alexithymia and a 75% increase in the no-alexithymic group; 2x2 chi-square tests were not significant ( $p$ 's > .236). LMM analyses among alexithymics showed a large reduction in PTSS by EW ( $n = 13$ ;

$t_{(\text{pooled})} = -3.78, d = 1.05, p < .001$ ) and a medium ES by BTO ( $n = 14; t_{(\text{pooled})} = 2.39, d = 0.64, p = .017$ ); the difference was not significant ( $p = .287$ ).

At 14-day post BTO showed a significantly larger ES in reducing rumination than EW, but this was not maintained at 30-day follow-up (Table 1). BTO maintained a medium ES from 14-day post to 30-day follow-up; EW did not achieve a significant reduction at either interval. Based on lowest, middle, and highest thirds of negative rumination scores at baseline, EW showed a 21% reduction in participants with high negative rumination scores, while BTO showed a 53% reduction. A 2x2 chi-square test for this subgroup was not significant ( $p = .391$ ). LMM procedures compared the impact of each condition on PTSS among high ruminators. At 30-day follow-up, both treatments showed a large ES ( $n_{\text{EW}} = 14, t_{(\text{pooled})} = -3.07, d = 0.82, p = .002; n_{\text{BTO}} = 15, t_{(\text{pooled})} = -3.97, d = 1.03, p < .001$ ) and the difference was not significant ( $p = .584$ ).

In addition to the above results regarding hypothesized differences between conditions, Table 2 summarizes overall bivariate correlations at baseline and 30-day follow-up. At baseline, using Cohen's recommendations for interpreting strength of correlations (0.1 = small; 0.3 = medium; 0.5 = large; Cohen, 1988), PTSS were found to be strongly associated with depression and negative rumination, and moderately associated with physical symptoms, alexithymia, and thought avoidance. At 30-day follow-up PTSS were most strongly associated with thought avoidance, followed by rumination, depression, and alexithymia. Differences in correlation strengths between baseline and 30-day follow-up were assessed with Fisher's Exact Test; they were not significant.

Table 2. *Bivariate correlations between PTSD symptoms and other variables of interest (small  $r = 0.1$ , medium  $r = 0.3$ , large  $r = 0.5$  per Cohen, 1988).*

	PTSD Symptoms (MPSS-SR)	Depression Symptoms (DASS-21)	Physical Symptoms (PILL)	Negative Rumination (RRS)	Alexithymia (TAS-20)	Thought Avoidance (WBSI)
PTSD Symptoms (MPSS-SR)	1	.54***	.41***	.58***	.34**	.44***
Depression Symptoms (DASS-21)	.44***	1	.34**	.71***	0.56***	.50***
Physical Symptoms (PILL)	.32**	.41***	1	.46***	0.44***	.51***
Negative Rumination (RRS)	.47***	.58***	.49***	1	0.53***	.54***
Alexithymia (TAS-20)	.43***	.43***	.26*	.43***	1	.50***
Thought Avoidance (WBSI)	.59***	.42***	.36**	.46***	.54***	1

Correlations above the diagonal are at baseline; below the diagonal are at 30-day follow-up.

MPSS-SR = Modified PTSD Symptoms Scale-Self Report; DASS-21 = Depression, Anxiety, and Stress Scale; PILL = Pennebaker Inventory of Limbic Languidness; WBSI = White Bear Suppression Inventory; TAS-20 = 20-item Toronto Alexithymia Scale; RRS = Ruminative Response Scale; EW = expressive writing; BTO = brief trauma organizer; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Post-hoc analyses.** Given our overarching concern of understanding barriers to obtaining benefits from EW, a final set of analyses were conducted based on DSM-5 criteria for PTSD. Three subgroups were identified: participants whose SLS did not meet Criterion A for PTSD (“No Criterion A”;  $n = 21$ ; e.g., natural death of a loved one); participants with a Criterion A stressor who did not endorse sufficient other symptoms of PTSD (“Criterion A – Not PTSD”;  $n = 45$ ); and those whose responses met criteria for PTSD (“Likely PTSD”;  $n = 17$ ).

Our first *post hoc* hypothesis, based on PTSD conceptualization (APA, 2013; Foa et al., 2007; Resick et al., 2007) and the theorized barriers to recovery reviewed above, was that the Likely-PTSD group would be distinguished from both other groups by greater depressive and physical symptoms, and higher thought avoidance, alexithymia, and negative rumination at baseline. A 3 (groups) X 6 (measures) ANOVA was conducted to test this hypothesis. The groups were not distinguished based on mean physical symptoms ( $p = .121$ ) nor alexithymia ( $p = .102$ ) scores. However, the Likely-PTSD group showed significantly higher PTSS than both the No Criterion A ( $M_{\text{diff}} = 40.04, p < .001$ ) and Criterion A – Not PTSD ( $M_{\text{diff}} = 39.69, p < .001$ ) groups. The Likely-PTSD group also had significantly higher depression scores than both the No-Criterion A ( $M_{\text{diff}} = 4.54, p = .019$ ) and Criterion A – Not PTSD ( $M_{\text{diff}} = 5.02, p = .002$ ) groups. On thought avoidance, the Likely-PTSD group showed significantly higher scores than the No Criterion A ( $M_{\text{diff}} = 8.02, p = .049$ ) and Criterion A – Not PTSD ( $M_{\text{diff}} = 8.22, p = .017$ ) groups. The Likely-PTSD group also had a significantly higher mean negative rumination score than the Criterion A – Not PTSD group ( $M_{\text{diff}} = 14.02, p < .001$ ), although their rumination was on par with that of the group without a Criterion A stressor ( $M_{\text{diff}} = 8.86, p = .053$ ).

Given these findings and the theories described above, we then hypothesized that thought avoidance, alexithymia, and negative rumination would predict membership in the Likely-PTSD group among those who reported a Criterion A stressor ( $n = 66$ ). Logistic regression supported this hypothesis for negative rumination (OR = 1.11,  $p = .005$ ) but not for thought avoidance ( $p = .162$ ) or alexithymia ( $p = .244$ ). When entered alone, negative rumination improved the correct classification of Criterion A individuals into Likely-PTSD by 4.8%; and it explained a third of the variance in group membership (Nagelkerke  $R^2 = .325$ ).

Our hypotheses predicting BTO superiority over EW were also applied within the diagnostic subgroups. First, a series of *t*-tests were conducted and found that minor differences in baseline scores between EW and BTO for each variable of interest were not significant (all *p*'s > .148). Table 3 summarizes ES's within and between conditions at 30-day follow-up on the six variables of interest based on PTSD diagnostic criteria.

Table 3. Pooled effect sizes (*t* and Cohen's *d*) at 30-day follow-up based on diagnostic category and treatment (small  $d = 0.2$ , medium  $d = 0.5$ , large  $d = 0.8$  per Cohen, 1988).

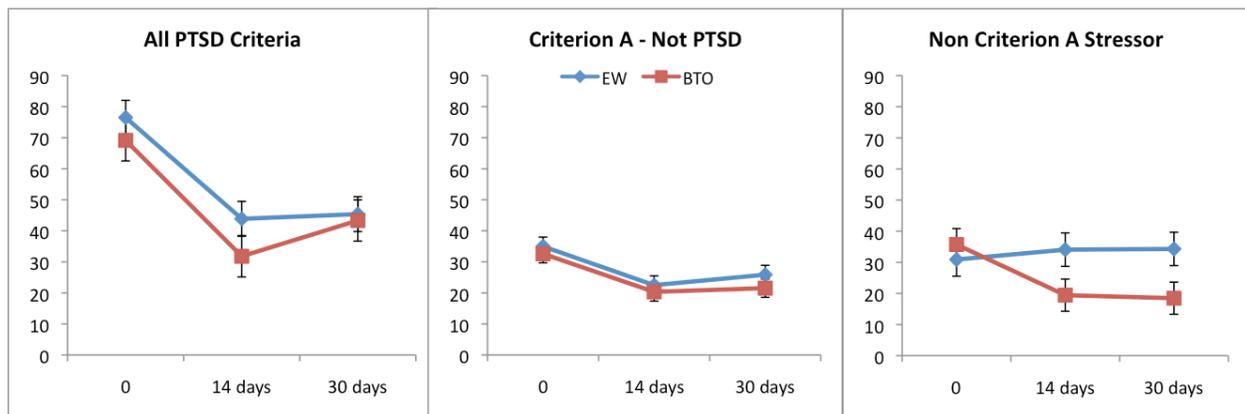
	No Criterion A Stressor ( <i>n</i> = 21)			Criterion A - Not PTSD ( <i>n</i> = 45)			Likely-PTSD ( <i>n</i> = 17)		
	EW ( <i>n</i> = 10)	BTO ( <i>n</i> = 11)	<i>diff</i>	EW ( <i>n</i> = 22)	BTO ( <i>n</i> = 23)	<i>diff</i>	EW ( <i>n</i> = 10)	BTO ( <i>n</i> = 7)	<i>diff</i>
	Pooled <i>t</i> ( <i>d</i> ) Within	Pooled <i>t</i> ( <i>d</i> ) Within	Pooled <i>t</i> ( <i>d</i> ) Between	Pooled <i>t</i> ( <i>d</i> ) Within	Pooled <i>t</i> ( <i>d</i> ) Within	Pooled <i>t</i> ( <i>d</i> ) Between	Pooled <i>t</i> ( <i>d</i> ) Within	Pooled <i>t</i> ( <i>d</i> ) Within	Pooled <i>t</i> ( <i>d</i> ) Between
PTSD Symptoms (MPSS-SR)	0.66 (0.21)	-3.47** (-1.05)	2.89** (1.26)	-2.84** (-0.61)	-3.50*** (-0.73)	0.43 (0.13)	-5.20*** (-1.64)	-3.65*** (-1.38)	0.57 (0.28)
Depression Symptoms (DASS-21)	1.17 (0.37)	-1.68 (-0.51)	2.02* (0.88)	0.08 (0.02)	-3.23** (-0.67)	2.31* (0.69)	-2.71** (-0.86)	-2.10* (-0.79)	-0.13 (-0.06)
Physical Symptoms (PILL)	-1.58 (-0.50)	0.67 (0.20)	-1.61 (-0.70)	-1.87† (-0.40)	-3.22** (-0.67)	0.91 (0.27)	-1.21 (-0.38)	-0.60 (-0.23)	-0.32 (-0.16)
Thought Avoidance (WBSI)	-1.27 (-0.40)	-3.72*** (-1.12)	1.67† (0.73)	-0.55 (-0.12)	-2.71** (-0.57)	1.49 (0.44)	-2.16* (-0.68)	-2.14* (-0.81)	0.23 (0.11)
Alexithymia (TAS-20)	-0.31 (-0.10)	-0.85 (-0.26)	0.38 (0.17)	-0.38 (-0.08)	-2.38* (-0.50)	1.36 (0.41)	-2.31* (-0.73)	-0.87 (-0.33)	-0.83 (-0.41)
Negative Rumination (RRS)	0.99 (0.31)	-1.23 (-0.37)	1.57 (0.69)	0.17 (0.14)	-1.85† (-0.39)	1.41 (0.42)	-2.06* (-0.65)	-1.46 (-0.55)	-0.21 (-0.10)

MPSS-SR = Modified PTSD Symptoms Scale-Self Report; DASS-21 = Depression, Anxiety, and Stress Scale; PILL = Pennebaker Inventory of Limbic Languidness; WBSI = White Bear Suppression Inventory; TAS-20 = 20-item Toronto Alexithymia Scale; RRS = Ruminative Response Scale; EW = expressive writing; BTO = brief trauma organizer; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Among those with Likely-PTSD, both conditions showed very large comparable ES's for PTSS reduction (Figure 2) and large ES's for depression score reduction. Both conditions also showed significantly reduced thought avoidance with no difference between conditions. Only EW showed moderate reduction of alexithymia and negative rumination but the differences between conditions were not significant. In terms of end-state functioning, of the 10 EW participants with Likely-PTSD at baseline, only three were still in the Likely-PTSD group at 30-day follow-up (70% reduction). For BTO, of the seven participants with Likely-PTSD at

baseline, four were still in the Likely-PTSD group at 30-day follow-up (43% reduction); a 2x2 chi-square test was not significant ( $p = .476$ ). Both conditions showed reductions in the number of participants in the highest levels of thought avoidance, alexithymia, and rumination scores, but differences in reductions between conditions were not significant based on chi-square tests (all  $p$ 's  $> .800$ ).

Figure 2. Reductions in PTSD symptoms (MPSS-SR) grouped by PTSD Criterion A.



MPSS-SR = Modified PTSD Symptoms Scale-Self Report.

Among those with a Criterion A stressor but not PTSD, both conditions achieved a moderate comparable ES in PTSS reduction. Only BTO reduced depression scores; the difference between conditions was significant. BTO also unilaterally achieved significant reductions in physical symptoms, thought avoidance, alexithymia, and rumination, but differences between treatments were not significant. When examined as number of participants remaining in the highest levels of thought avoidance, alexithymia, and rumination scores, BTO showed a significantly better reduction in the number of high ruminators (BTO reduced from 6 to 0, while EW retained its initial 4; chi-square = 4.2,  $p = .040$ ); EW saw a small increase in alexithymics at 30-day follow-up (from 6 to 8) while BTO reduced the number of alexithymics (from 8 to 4); a 2x2 chi-square test was not significant ( $p = .225$ ).

For those whose SLS was not a PTSD Criterion A stressor, only BTO significantly reduced PTSS, with EW slightly increasing PTSS on average, and the difference was significant. EW also increased depression symptoms while BTO reduced them; neither change was significant yet the resulting difference was significant. BTO alone significantly reduced thought avoidance in this subgroup. Neither condition significantly reduced physical symptoms, alexithymia, or negative rumination in this subgroup. EW showed a small but not significant increase in number of alexithymics (from 2 to 4) while BTO saw a slight reduction (from 3 to 2). Both conditions saw comparable reductions in number of high thought avoiders (both reduced by 3). Neither condition showed a change in number of high ruminators ( $n = 3$ ).

Lastly, moderation analyses were conducted using the PROCESS macro (v. 2.15; Hayes, 2013) on SPSS (v. 20) to statistically quantify the finding above that Criterion A moderated the effect of the treatments on PTSS. Only cases with complete data for 30-day follow-up were analyzed ( $n = 65$ ). Analyses used 10,000 bootstrap samples with replacement, using a bias-corrected approach with mean centering to improve accuracy. The model used treatment condition (BTO = 0, EW = 1), Criterion A (0, 1), and meeting PTSD criteria B-E (0, 1) to predict PTSD symptom severity at 30-day follow-up; baseline PTSS was entered as a covariate. The model explained 61% of the variance in PTSS at follow-up ( $R = 0.78$ ,  $F(8, 56) = 9.32$ ,  $p < .001$ ). The interaction between condition and Criterion A was significant ( $b = -19.30$ ,  $MSE = 9.26$ ,  $t = -2.09$ ,  $p = .042$ ,  $95\% \text{BCa-CI} = -37.84, -0.76$ ), but no other interactions were significant ( $p$ 's  $> .108$ ). The analysis was re-run using only Criterion A as a moderator. The new model explained 53% of the variance in final PTSD severity scores; 6% of that was due to the interaction of condition and Criterion A ( $F(1, 60) = 4.84$ ;  $p = .032$ ). Among those without a Criterion A stressor, EW showed 25.9 fewer points of symptom reduction than BTO ( $SE = 8.89$ ,

$t = 2.91, p = .005, 95\% \text{BCa-CI} = 8.12, 43.68$ ). Among those with a Criterion A stressor, the difference in mean PTSS reductions between conditions was not significant ( $b = 4.25, SE = 4.00, t = 1.06, p = .292, 95\% \text{BCa-CI} = -3.75, 12.24$ ).

### **Discussion**

This report had several objectives. First we reviewed the high prevalence of exposure to potentially traumatic events (PTEs) and the well-documented associations between PTEs and serious life stressors (SLSs) and worse mental and physical health, and greater healthcare utilization. Next, we explored evidence regarding aspects of EW, PE, and CPT that appear to foster or obstruct adjustment to PTEs and SLSs, with an emphasis on avoidance, alexithymia, and rumination. We also briefly cited evidence from third-wave and forgiveness literature regarding practices that could be helpful in trauma/SLS recovery. We then introduced a highly structured brief protocol (BTO) which incorporates elements from trauma therapies as well as third-wave CBTs and other lines of research in an effort to mitigate avoidance, alexithymia, and negative rumination. An RCT examined whether BTO would achieve clinically significant reductions in symptoms of PTSD, depression, and physical illness, and do so more effectively than a typical EW protocol. BTO was also expected to significantly lower avoidance, alexithymia, and negative rumination scores, and to a significantly higher degree than EW. Finally, embedded in this study was also a test of whether administration in single participant visits of 1.5 to 2 hours would be tolerable and yield the expected benefits.

Both treatments were effective and comparable in reducing self-reported PTSS scores, and large ES's at 14-day post assessment were substantially maintained at 30-day follow-up. Our primary hypothesis that BTO would be more effective than EW was not supported in the overall sample. These results suggest both can offer significant clinical improvements in recovering

from the effects of a PTE or SLS.

The initial study design did not anticipate stratifying the sample using DSM-5 PTSD stressor criteria. Fortunately, the sample size and distribution of participant stressors allowed sufficient power for preliminary observations about the effects of these interventions on three subgroups based on DSM5 diagnostic criteria for PTSD. Among the two subgroups reporting a Criterion A stressor (i.e., one group endorsing sufficient other criteria for PTSD and the other not), ES's between treatments did not significantly differ at 30-day follow-up; **large** comparable ES's were found in the Likely-PTSD group and **moderate** comparable ES's were found in the Criterion A Non PTSD group. However, for the Lacking Criterion A group, BTO emerged as **superior** to EW in reducing PTSS scores; BTO showed a **large** sustained symptom reduction while EW saw mean scores slightly worsen (albeit not significantly). Additionally, analyses suggested EW effectiveness is moderated by the presence or absence of a Criterion A stressor. This may be helpful in understanding the history of mixed results in EW studies; EW studies may benefit from grouping participants based on whether their stressor meets Criterion A for PTSD.

In terms of end-state functioning for those in the Likely-PTSD group, EW reduced membership by 70% at follow-up, while BTO only reduced it by 43%. An overall conclusion may be drawn that among individuals with a Criterion A stressor suffering from PTSS, clinicians can offer either intervention in a 2-hour window and expect positive results. It may be that individuals and clinicians who are wary of initiating a treatment like PE or CPT due to lack of healthy coping skills may be better served by using one of these single-visit interventions to build rapport, offer immediate symptom reduction, and improve expectations for subsequent thorough treatment.

This study also examined the impact of both treatments on self-reported depression scores for victims of PTEs. In the full sample, EW was significantly less effective than BTO in reducing depression associated with a PTE; this was supportive of our hypothesis. However, when our sample was stratified by PTSD criteria, EW performed strongly and comparably to BTO in reducing depression in the Likely-PTSD group (large ES's). EW showed no reduction in depression among those with Criterion A stressor but not PTSD, and a non-significant increase in depression among those lacking a Criterion A stressor. BTO showed a large sustained ES for reducing depression among the Likely-PTSD group and a medium ES in the two non-PTSD groups.

Taken together, these preliminary findings suggest EW works best with people who meet full criteria for PTSD, and least well for those who lack a Criterion A stressor. It may be that EW works best with past stressors rather than chronic or ongoing ones; there have been findings that EW does little for caregivers of individuals dealing with a chronic illness (Ashley et al., 2011). Of course, these results are preliminary due to small subgroup sample sizes and lack of diagnostic interviews.

Given the large literature base showing PTEs and SLSs being associated with lowered immunology, various medical conditions, and greater healthcare utilization, we also assessed changes in self-reported physical symptoms and found moderate associations between physical symptoms and PTSS. In terms of physical symptom reduction, at 14 days post treatment both conditions showed moderate comparable reductions in the full sample. However, by 30-day follow-up only small ES's were maintained. The subsamples showed that only the non-PTSD Criteria A group showed sustained significant benefits, of moderate ES under both conditions. These findings are consistent with EW meta-analyses that showed larger physical symptom

improvements among healthy populations than among clinical populations (Frisina et al., 2004; Smyth, 1988). Unfortunately there is little data from CPT and PE studies on changes in physical symptoms and healthcare utilization following these interventions.

Another objective of this study was to better understand relationships between EW and BTO with a construct that can be described as avoidance, suppression, or otherwise rejection of “internal experiences” (e.g., distressing memories, thoughts, emotions; Hayes et al., 2004). Such avoidance and related unwillingness to experience distress or physiological arousal have been theorized to obstruct habituation to memories, emotions, and sensory cues (Foa et al., 2007). Congruent with PTSD theory (APA, 2013), we found a moderate relationship between our measure of thought avoidance and PTSS at baseline and follow-up. In terms of change, BTO performed significantly better than EW in reducing thought avoidance at 14-day post but at 30-day follow-up the difference was no longer significant. It may be that without follow-up people return to old patterns. Nevertheless, both interventions showed a 2/3 reduction in people belonging to the highest thought avoidance level established at baseline. When stratified by diagnostic criteria, only BTO showed moderate and large reductions in thought avoidance across diagnostic groups (as with PTSS and depressive symptoms), while EW only showed a significant reduction in thought suppression in the Likely-PTSD group. It may be that the active promotion of acceptance by BTO explains the difference, which would be congruent with Sloan et al. (2012) and Rogers et al. (2007).

Another relationship explored in this study was that between alexithymia and PTSS; it was theorized that lack of facility for identifying and describing emotions would be associated with higher PTSS. Congruent with our expectations, we found a moderate association between alexithymia and PTSS. BTO intentionally targeted alexithymia by providing word lists. With the

full sample, reductions in alexithymia scores were comparable and modest between treatments, yet only BTO's reductions achieved statistical significance. EW results were mixed; at follow-up, EW showed more people meeting criteria for alexithymia than at baseline, as well as movement from possibly-alexithymic to non-alexithymic. EW appears to help some and hinder others in their perceived ability to identify and express their emotions. With BTO, results showed consistent decreases from higher to lower levels of alexithymia. In terms of how these treatments helped participants with high alexithymia at baseline, LMM analyses showed a large reduction in PTSS by EW and a medium ES by BTO, although the difference was not statistically significant. These findings suggest both interventions help alexithymics. This finding is congruent with theorization by Baikie (2008) that alexithymics benefit from encouragement to take time to describe their emotional experiences in relation to a PTE or SLS.

Lastly, this study examined the relationship between negative rumination and PTSS; a strong association was found. Negative rumination was also found to be a significant predictor of participants with a Criterion A stressor who would meet all other PTSD symptom cluster criteria, explaining 33% of the variance in membership in the Likely-PTSD group. Thus, lowering or mitigating rumination could be an important target for trauma treatment. When the top third ruminators in each treatment were compared, both treatments showed large comparable ES's in reducing PTSS at 30-day follow-up; this suggests high rumination at baseline is not a large obstacle for either condition in its ability to reduce PTSS. However, we did expect BTO would mitigate rumination better than EW, and that EW might even increase rumination, but these expectations were only partially supported. In the full sample, BTO showed an initial significant superiority in reducing rumination at 14-day post but this was not sustained at 30-day follow-up; follow-up sessions would likely be helpful. In the samples stratified by PTSD criteria, EW

unexpectedly and exclusively showed a significant reduction in negative rumination in the Likely-PTSD group. This is consistent with exposure and acceptance literature but contradicted our expectation that EW would increase rumination and that BTO would decrease it. Taken together, these findings suggest EW reduces rumination among those with Likely-PTSD but not as effectively with non-PTSD groups, and BTO helps reduce high rumination initially but does not sustain a month after the treatment. This may be indicative of a limitation of brief therapeutic approaches; both may be helpful for symptoms related to arousal and anxiety, and less effective with sustained change of cognitive habits.

**Conclusions.** Overall, both interventions demonstrated that nearly immediate prolonged exposure to disturbing memories in a clinical setting with the presence of a supportive novice researcher/therapist is tolerable and largely beneficial. Both interventions were effective among individuals with a Criterion A stressor, and BTO was also effective with a wider range of SLSs. This finding alone may be helpful to clinicians who view trauma histories as a “Pandora’s Box” that must only be opened by advanced therapists or in settings that offer continuity of care. At another extreme, some clinicians may be overestimating the degrees of exposure patients can tolerate at home. For example, with CPT clients are assigned to write an “impact statement” and then a “trauma narrative” at home early in the treatment, and PE asks patients to begin *in vivo* exposures outside of therapy sessions following the second session of treatment. Our study implies these assignments can take 20-45 minutes with a therapist and be reinforcing, or if left to individuals to do at home they may be avoided for hours, days, and weeks and continue to reinforce avoidance/escape behaviors. The dropout rates from PE and CPT studies between assessment and intervention (Mott et al., 2014), and the sizable dropout rates by the third or fourth session (Davis, Walter, Chard, Parkinson, & Houston, 2013; Gutner et al., 2015; Kehle-

Forbes et al., 2016), may be testimonies to a need some patients have for receiving doses of exposure in a safe, structured setting rather than as home assignments. Our study demonstrates that a single 2-hour visit with several prolonged imaginal exposures separated by 5-10 minute breaks could be extremely helpful in reducing PTSS. It may also be that achieving rapid symptom remission instead of prioritizing transmission of skills can achieve greater commitment to the longer-term work of PE or CPT.

Based on this small sample study, individuals with alexithymia and the highest levels of cognitive avoidance and negative rumination benefitted significantly from both EW and BTO in reducing PTSS. However, the effectiveness of EW appears to be moderated by PTSD stressor criteria. EW was most effective with people who endorsed full DSM-5 PTSS, and least effective with people lacking a Criterion A stressor (but that group would have to be better understood; the important difference may be discreet versus ongoing stressor rather than Criterion A). With the Likely-PTSD group, EW not only reduced PTSS and depression symptoms, but also reduced thought avoidance, alexithymia, and rumination. Working with Likely-PTSD participants, BTO was comparable to EW regarding PTSS and depression symptoms, as well as thought avoidance, but reductions in alexithymia and rumination were not maintained at 30 days. When full PTSD criteria are not met, BTO appears to be a better choice for adjusting to SLSs and PTEs.

Given the high prevalence of PTEs and SLSs; the low resource requirement of EW; the findings by Sloan et al. (2012), Bragdon and Lombardo (2012), and the present study; it appears that supervised EW should not be feared as an intervention for patients who meet PTSD criteria. This conclusion should not be interpreted as promoting the generic advice to “try journaling;” rather our positive results occurred using a highly structured format in a setting in which a clinician remained present, and periodically obtained SUD ratings in a warm and supportive

manner. BTO also appears to offer great promise, across a wider range of stressor types, and may be helpful with individuals who initially resist writing about or even discussing their PTE or SLSs; BTO does not initially inquire about the event until after several steps are completed to organize related emotions, cognitions, and sensory cues.

**Limitations.** This study had several limitations. First, BTO and EW were not equivalent in terms of therapist interaction. In both conditions, the therapist/researcher was present to answer questions and ensure adequate understanding of the protocol instructions. However, given the simplicity of EW instructions, few questions were asked by participants. In the BTO condition, the entire session involved therapist guidance, feedback, and prompting. This inequality in therapist interaction was justified because what was primarily being tested and compared was the degree to which symptom reduction could be achieved in the same limited time frame of EW protocols. Another limitation was incomplete data. Several post-assessment scores were not completed by participants so a robust imputation technique was incorporated.

Prolonged exposure to the assessment instruments themselves could foster habituation and cognitive processing and thereby alter symptom outcomes regardless of treatment condition. For this reason, assessment instruments were selected that minimized consideration of specific details or emotions related to the trauma. However, there may have been beneficial effects from the repeated exposures that occurred when contacting participants and having them complete assessments at 14 and 30 days post intervention that might not occur outside the context of a study. Clinicians are encouraged to follow-up with clients since these contacts may contribute to the habituation process.

Lastly, results from interventions with 18-24 year-old college students may not apply to people with alternative educational backgrounds, or to adolescents or older adults, or to

ethnicities that differ from our mostly Caucasian sample. In addition, the setting of a university laboratory, the incentive of research credit and a possibly winning a \$50 gift card, the presence of researchers, and the careful administration of, and adherence to, protocols may have influenced results. Different results may occur under less controlled and incentivized conditions.

This study had several strengths. The sample size was above the number calculated as necessary to test the original hypotheses. It used an active control, which made it possible to offer a beneficial experience for most participants. Assessments were conducted not only at baseline and 2-week post, but also at 30-day follow-up, which allows for more accurate assessment of changes in frequencies of events such as nightmares. The study was also strengthened by not restricting PTEs to current DSM definitions of traumatic events.

Given the well-documented relationships between PTEs and SLSs on healthcare utilization, difficulties engaging patients after psychiatric hospitalization, and problems with attrition from PE and CPT, future research would be beneficial regarding the use of EW and BTO in inpatient settings, and as preliminary treatments before engaging in PE or CPT.

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