THE ROLE OF EMOTION REGULATION IN THE EXPRESSIVE WRITING INTERVENTION

by

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Abstract

Expressive Writing (EW) involves asking participants to write emotionally about stressful life events and has been associated with improvements in psychological and physical health. The purpose of the current study was to extend previous work by examining the moderating and mediating role of emotion regulation within the EW intervention. Sixty participants who had experienced a traumatic event were recruited from the community and were assigned to an EW or control writing condition. Measures assessing emotion regulation and indices of psychological and physical health were administered at baseline and one month follow-up to determine changes in symptomatology. In comparison to control writing, EW led to significant improvements in depression, emotional clarity, and to a lesser degree emotional awareness. Although no other group differences were found, all participants demonstrated significant improvements in their symptoms of posttraumatic stress, reported physical health, overall emotion regulation abilities, their ability to accept their emotions, engage in goal directed behaviour when distressed, and access emotion regulation strategies they perceive as effective. No support was found for our moderation hypothesis. However, a significant moderation was discovered revealing that difficulties engaging in goal directed behaviour when distressed moderated improvements in posttraumatic stress symptoms. Specifically, control participants with this emotion regulation deficit demonstrated significantly poorer outcomes than control participants without this deficit; in comparison to the EW group participants who improved similarly on posttraumatic stress
symptoms regardless of their level of difficulties at baseline engaging in goal directed behaviour when distressed. Additionally, baseline emotion regulation abilities predicted improvements on psychological health (but not physical health) outcome measures for both groups. No support was found for our mediation hypothesis. Exploratory analyses revealed that the EW group demonstrated greater emotional arousal in response to their writing in sessions 1 and 2, but that by session 3 their arousal had significantly decreased and was equivalent to that of the control group, which showed no changes in arousal across sessions. No support was found for the moderating or mediating influence of arousal on outcome. Results will be discussed within a model of emotional expression and emotion regulation and compared to the existing EW literature.
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Chapter 1:
Literature Review

It is argued that “men, women, and children have been exposed to traumatic events since prehistoric times” (Friedman, Resick, & Keane, 2007, p. 11). Existing research suggests that the likelihood of being exposed to a traumatic event is quite high, ranging from approximately 50% to 90% of the Western population having experienced at least one traumatic event during their lifetime (Norris & Slone, 2007). Despite the frequency with which individuals experience traumatic events, efforts to document and understand traumatic experiences as well as the associated consequences from a more scientific/medical perspective have only arisen since the mid 19th century (Friedman et al., 2007). Moreover, the term “posttraumatic stress disorder” (PTSD), which is used to describe the enduring emotional reaction to trauma, was not introduced into the Diagnostic and Statistical Manual for Mental Disorders (DSM) until 1980 when the third edition was published by the American Psychiatric Association, (APA, 1980). Similarly, the term “acute stress disorder” (ASD), which is used to describe the acute stress reaction in the initial month following a traumatic stressor, was not introduced into the DSM until 1994 when the fourth edition was published (APA, 1994).

According to the most recent edition of the DSM, the DSM-IV-TR (APA, 2000), a traumatic stressor is defined as a “direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one’s physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate” (APA, 2000, p. 463). Additionally, the person’s response during or after to the traumatic event must involve significant levels of fear,
helplessness, or horror. Examples of traumatic events according to the DSM-IV-TR criteria (APA, 2000) include, but are not limited to, various direct experiences (e.g., physical or sexual assault, robbery, torture, military combat, automobile accident, natural disaster, or being diagnosed with a life threatening illness); witnessed experiences (e.g., observing serious injury, unnatural death, a dead body, or body parts of another person as a result of assault, war, accident, or disaster); and learned about experiences (e.g., being informed that a loved one has been abused, raped, assaulted or killed).

In regards to the DSM criteria necessary for a diagnosis of PTSD (APA, 2000), a number of symptoms in response to a traumatic event are required to exist for at least one month, and need to cause clinically significant distress or impairment. These include one or more re-experiencing symptoms; three of more avoidance or numbing symptoms (not present before the traumatic event); and two or more increased arousal symptoms (not present before the traumatic event). Similarly, a diagnosis of ASD involves a more acute emotional reaction to a traumatic stressor (lasting between two days to four weeks) characterized by the endorsement of three or more dissociative symptoms; one or more re-experiencing symptoms; marked avoidance of trauma reminders; and marked increased arousal symptoms.

Research suggests that most individuals who have experienced a traumatic event will go on to develop at least some symptoms of PTSD (Blanchard & Hickling, 2004; Rothbaum, Foa, Riggs, Murdoch, & Walsh, 1992). However, half of trauma survivors will experience complete remission of their PTSD related symptoms within the initial three months (APA, 2000). Although the prevalence rate of PTSD varies depending on the population being studied (see Norris & Slone, 2007, for a review), North American estimates suggest a lifetime prevalence rate of approximately 8% (APA, 2000).
The costs associated with PTSD are widespread. For instance, research suggests that PTSD can lead to a lower quality of life (Malik, Conner, & Sutherland, 1999), and various functional impairments and related difficulties (Kulka, Schlenger, & Fairbank, 1990, as cited in Litz & Maguen, 2007). Additionally, those suffering from PTSD are prone to disruptions in their relationships with family and friends, which are often characterized by feelings of estrangement on the part of the traumatized individual, or PTSD related anger which can often lead to domestic violence (Taylor, 2006). Various economic costs are also associated with PTSD given trauma related symptoms have the potential to lead to lower work productivity (Savoca & Rosenheck, 2000), increased absenteeism from work (Taylor, 2006), and higher health care service utilization (Switzer et al., 1999; Walker et al., 2003).

According to Bryant (2006), “the persistent distress that can be suffered by many trauma survivors has led to unprecedented attention on creating ways to prevent this distress” (p. 201). Therapies of different orientations have made attempts to treat PTSD related distress, including cognitive behavioural, dialectical behavioural, acceptance/mindfulness based approaches (see Follette & Ruzek, 2006), as well as emotion focused treatment approaches (Elliot, Davis, & Slatick, 1998; Paivio & Pascual-Leone, 2010). A commonality between each of these approaches is that they encourage the expression of emotions related to the traumatic event.

Emotional expression has long been viewed as an important contributor to good physical and psychological health and is emphasized in many forms of psychotherapy (Elliot, Watson, Goldman, & Greenberg, 2004; Greenberg, 2002; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999; Sloan & Kring, 2007). Emotionally expressive writing techniques are also commonly found in psychotherapy, and have been increasingly encouraged within session or as homework throughout the psychotherapy process (Bolton, Howlett, Lago, & Wright, 2004; Graf,
Gaudiano, & Geller, 2008; Leahy, 2003; Lepore & Smyth, 2002b; Resick & Calhoun, 2001). In recent years these emotionally expressive writing techniques have become the topic and focus of research for a number of reasons (Lepore & Smyth, 2002a).

First, an abundance of studies have demonstrated the effectiveness and success of the writing procedure developed by James Pennebaker and his colleagues (Pennebaker & Beall, 1986). This procedure, known as expressive writing (EW), involves asking participants to write as emotionally as possible about their most traumatic life event or stressful experience on several occasions for about 20-30 minutes. Research has repeatedly demonstrated that EW leads to improvements in reported physical health, psychological health, as well as medical, physiological, and general functioning (Frattaroli, 2006; Frisina, Borod, & Lepore, 2004; Smyth, 1998). A second reason as to why increased attention has been paid to the EW procedure is because it represents a practical, low-cost intervention that clinicians may find useful to utilize with their clients (Lepore & Smyth, 2002a). Third, despite a desire to discuss personally traumatic and stressful experiences with other individuals, a number of limitations and constraints exist that prevent people from being able to express their thoughts and emotions. For instance, a person may not be able to discuss their trauma related thoughts and feelings due to social constraints, personal inhibitions, a lack of availability or suitability of services, or limited mobility that makes accessing services difficult (Lepore, Silver, Wortman, & Waym, 1996; Lepore & Smyth, 2002a). The use of the EW intervention allows these obstacles to be overcome by offering individuals the opportunity to express their thoughts, feelings, and needs without concern that they will be judged, criticized, rejected, or incur social or interpersonal consequences for doing so.
Despite an accumulating amount of research suggesting that the EW intervention has beneficial effects on psychological and physical health for many people who have experienced a traumatic or stressful experience, two questions remain unanswered in the existing literature:

1. What factors moderate the beneficial outcomes seen in EW studies?
2. What are the mediating variables that lead to these improvements?

Answers to these two questions have been the focus in the recent EW literature and were addressed in the current study. More specifically, the purpose of the current study was threefold. First, with a group of community participants who had endorsed distress related to experiencing a traumatic or stressful event, we attempted to examine whether those assigned to an emotionally EW condition demonstrated greater benefits in psychological and physical health following the task in comparison to a control writing group. Second, we investigated whether emotion regulation moderated improvements in outcome in the EW intervention. The third aim of the current study had two related objectives. First, we attempted to investigate whether the EW intervention would increase and enhance an individual’s emotion regulation abilities. Related to this, we then went on to examine whether emotion regulation mediated the improvements observed in the EW procedure.

This paper begins with a review of the EW literature to date, by examining the therapeutic effectiveness of EW with both clinical and non-clinical populations. Subsequent to this, we will provide a general review of potential moderators that have been proposed to influence the outcome of the EW intervention. The next section will then go on to address the continuing puzzle as to why the EW intervention works, highlighting a number of potential theories that have been reviewed thus far in the literature. Next, a theoretical model of emotional expression and emotion regulation will be provided. In order to provide support for our
moderation hypothesis, evidence relating emotion regulation abilities to the psychotherapy and EW outcome literature will be reviewed. Finally, we will examine the evidence suggesting that the EW intervention may lead to the enhancement of emotion regulation abilities in participants who take part in the procedure, and how research suggests that these increases in emotion regulation abilities are one of the mechanisms by which psychological and physical health improvements are brought about. Before discussing any of these topics however, we will start by reviewing how this line of research began with a seminal study by Pennebaker and Beall (1986).

**Effectiveness of the Expressive Writing Intervention**

The initial EW study conducted by Pennebaker and Beall (1986) was grounded in the idea that a failure to express the thoughts and emotions related to traumatic events results in psychological and physical health difficulties. In this influential study, Pennebaker and Beall set out to investigate whether writing about traumatic events would impact long-term indices of physical health, as well as short-term measures of mood and physiological arousal. A total of 46 undergraduate participants were randomly assigned to one of four writing conditions:

1. a control condition where participants were instructed to write about different trivial topics (e.g., the shoes they were wearing, or a description of their living room);
2. a trauma-fact condition where participants were instructed to write about an upsetting experience without any reference to emotions;
3. a trauma-emotion condition where participants were instructed to write about the feelings they had in response to an upsetting experience with instructions not to describe what the experience entailed; and
4. a trauma-combination condition where participants were instructed to write about both the upsetting event and the thoughts and emotions they had in response to the event.

Participants in each writing group were requested to write their essays for 15 minutes on four consecutive evenings. The control group was requested to write about a different trivial topic each night, and the EW participants were given the option of writing about the same traumatic experience or to choose different topics each night. A number outcome measures were administered at baseline, post writing, as well as at follow-up 4 and 6 months later.

The results of Pennebaker and Beall’s (1986) study indicated that overall, writing emotionally about a traumatic experience (trauma-emotion condition and trauma-combination condition) resulted in higher levels of physiological reactivity and more negative mood immediately after writing in comparison to the control condition and the trauma-fact condition. However, at 4-month follow-up, those participants in the two emotionally EW conditions reported fewer physical health problems. Additionally, participants in the trauma-combination condition (but not the trauma-emotion condition) reported visiting the campus medical center less frequently than the other groups in the 6 months following the writing. Finally, it is important to mention that writing simply about the facts of the traumatic experience was not associated with reports of short-term distress or heightened physiological arousal, or any long-term improvements in health. This finding suggests that it was emotionally expressive writing which was necessary to bring about improvements.

Since Pennebaker and Beall (1986) published their influential study, a number of investigators have examined the benefits associated with the EW intervention by attempting to replicate and extend the findings. The types of extensions and modifications related to the EW
paradigm have come over the years in different waves of research (Frattaroli, 2006). Specifically, the EW intervention was initially tested on university students and employees, then members of the general community, individuals suffering from medical illness or disease, and finally those reporting psychological and psychiatric issues. Together, these studies have produced mixed yet promising results.

For instance, significant findings have emerged suggesting that, in comparison to control participants, EW participants demonstrate greater improvements in immune functioning (Pennebaker, Kiecolt-Glaser, & Glaser, 1988), reduced health centre visits (Pennebaker, Colder, & Sharp, 1990), decreased absenteeism from work (Francis & Pennebaker, 1992), improved grade point average at college (Pennebaker & Francis, 1996), and greater abilities to find new employment (Spera, Buhrfeind, & Pennebaker, 1994). Moreover, other researchers have demonstrated that, in comparison to control participants, EW participants display greater improvements in upper-respiratory problems (Greenberg, Wortman, & Stone, 1996), reduced distress for those suffering from asthma, rheumatoid arthritis (Smyth, Stone, Hurewitz, & Kaell, 1999), and migraine headaches (McKenna, 1997), reduction in breast cancer-related visits to the doctor (Stanton et al., 2002), as well as improved transplant-related quality of life for kidney transplant recipients (Possemato, Ouimette, & Geller, 2010). Furthermore, research suggests that, in comparison to control participants, EW participants demonstrate decreased infirmary visits in a sample of incarcerated men (Richards, Beal, Seagal, & Pennebaker, 2000), decreased stress symptoms in female caregivers adjusting to having a baby with autism (Campbell, 2003), improved psychological and physical health in a sample of participants with a history of anxiety (Russ, 1992), and improved symptoms of posttraumatic stress following writing about first episode psychosis (Bernard, Jackson, & Jones, 2006).
Although a number of studies have provided support for the potential benefits of the EW intervention, not all EW studies have demonstrated significant findings (Harris, 2006; Mogk, Otte, Reinhold-Hurley, & Kroner-Herwig, 2006). For instance, Stroebe, Stroebe, Schut, Zech, and van den Bout (2002) showed that widowed community members grieving the loss of their partners that were asked to write emotionally about this loss did not show any significant improvements over a control writing group on measures of psychological and physical health. Similarly, null findings were discovered in the literature by other researchers examining the effects of EW with bereaved populations (Bower, Kemeny, Taylor, & Fahey, 2003; O’Conner, Allen, & Kaszniai, 2005; Range, Kovac, & Marion, 2000). Because of these results within the existing EW literature, the decision was made for the current study to exclude participants who indicated that their distressing traumatic event was bereavement.

This decision was also made due to the research suggesting that bereavement is a unique type of trauma in comparison to other types of trauma, in terms of symptomatology and response to treatment (Shear & Frank, 2006; Stroebe et al., 2002). For instance, Stroebe and colleagues (2002) suggest that unlike other traumatic events often written about in EW studies, “in the case of bereavement, the writing task is superimposed on the normal process of change and recovery expected for the recently bereaved” (p. 176). Moreover, Stroebe and colleagues (2002) conclude that “in cases of uncomplicated bereavement the bereaved have to cope with their loss in their own time and their own way. Although social sharing and emotional disclosure can be regarded as helpful, they do not seem to accelerate the grieving process” (p. 177). The unique nature of bereavement is also evident when taking into account bereavement reactions that are more severe and enduring than most. This form of bereavement has commonly been referred to as complicated grief (Shear & Frank, 2006). In addition to the normal emotional response to trauma
which is characterized by symptoms of PTSD and depression, Shear and Frank (2006) argue that this particular traumatic event also results in separation distress; which has been defined as “intense yearning and longing, a tendency to engage in reveries about the deceased, and the desire to remain close to, or seek proximity to items belonging to the deceased” (p. 291). As mentioned above, it is for all of these reasons that the current study decided to exclude bereavement related traumatic stressors.

In regards other inconsistent findings within the literature, Gidron, Peri, Connolly, and Shalev (2006), have suggested that the EW intervention may in fact be harmful with clinical populations. For instance, a number of studies have found null findings suggesting that, in comparison to a control group, EW may not have any impact on participants who were previously psychiatric patients (Bird, 1992), those with a negative body image (Earnhardt, Martz, Ballard, & Curtin, 2002), individuals suffering with PTSD symptoms (Deters & Range, 2003), and those who reported suicidal tendencies (Kovac & Range, 2002). More recent work has continued to demonstrate inconsistent findings, as Low, Stanton, Bower, and Gyllenhammer (2010) failed to find a main effect for group in a sample of women diagnosed with metastatic breast cancer. Furthermore, two recently conducted meta-analyses have demonstrated that EW did not result in psychological or physical health gains over and above control participants (Mogk et al., 2006), nor did being assigned to the EW group lead to greater reductions in health care utilization in comparison to control participants (Harris, 2006).

Although it is apparent that the literature is replete with inconsistent findings (Gidron et al., 1996; Harris, 2006; Mogk et al., 2006; Walker, Nail, & Croyle, 1999), two meta-analyses have been conducted that have offered support for the effectiveness of the EW intervention with both non-clinical (Smyth, 1998) and clinical samples (Frisina et al., 2004). The meta-analysis
conducted by Smyth looked at EW studies involving “healthy” participants (i.e., community or college samples, non medical/psychiatric samples) and investigated the relationship between the EW intervention and subsequent health (reported physical health, psychological health, physiological functioning, general functioning, and health behaviours).

Overall, after evaluating 13 different studies, Smyth (1998) reported an effect size of .47 ($p < .0001$), indicating a 23% improvement in overall health in participants who had taken part in the EW intervention. Subsequent analyses indicated that the EW intervention led to significant improvements in self-reported physical health ($d = .42$), psychological health ($d = .66$), physiological functioning ($d = .68$), and general functioning ($d = .33$), but not in health related behaviours ($d = .029$), such as exercising, sleeping, smoking, drinking, and drug using habits. These findings further support the notion that the EW intervention is quite robust in bringing about significantly meaningful changes in a number of different psychological and physical health domains. However, one limitation worth mentioning about the studies used in Smyth’s meta-analysis is that they were comprised of “healthy” participants who did not meet criteria for psychological or medical illnesses.

A meta-analysis conducted by Frisina and colleagues (2004) was designed to address this limitation, because some studies examining EW with physically or mentally ill participants have suggested that the intervention has success with some populations (Schoutrop, Lange, Hanewald, Davidovich, & Solomon, 2002; Smyth et al., 1999; Stanton et al., 2002), but not with others (Gidron et al., 1996; Walker et al., 1999). Frisina and colleagues (2004) analyzed data from nine studies and found that EW significantly improved overall “health” ($d = .19; p < .05$). However, after further analyses it was discovered that the EW intervention appeared to be more effective for physical health outcomes ($d = .21; p = .01$) in comparison to psychological health outcomes.
Despite showing minimal or non-significant effect sizes on measures of automatic thoughts ($d = .32$), perceived stress ($d = .18$), suicide ($d = .07$), and negative affect ($d = -.27$), EW did result in significant improvements on a number of measures of psychological health including depression ($d = .56$), positive affect ($d = .55$), anxiety ($d = .39$), and sleep quality ($d = .68$).

Another apparent limitation of the EW intervention suggested by Frisina and colleagues’ (2004) findings is that the writing was less effective for psychiatric versus physically ill populations. In fact, when examining the results of specific studies used within the meta-analysis, null findings existed for studies using samples of participants diagnosed with PTSD (Gidron et al., 1996), those who were severely depressed or suicidal (Kovac & Range, 2002), and a group of psychiatric prison inmates (Richards et al., 2000). Frisina and colleagues (2004) offer a reason for these null findings by explaining that the majority of studies involving psychiatric samples did not exclude participants who were concurrently receiving medication or psychotherapy. Therefore, they argue that a lot of noise was introduced into the studies that made it difficult for them to clearly examine the effectiveness of the EW intervention.

This possibility is further supported by the fact that one study included in the Frisina meta-analysis used a sample of patients diagnosed with PTSD and found a significant and robust effect size for the EW intervention (Schoutrop et al., 2002). Also, a study conducted by Smyth, Hockemeyer, and Tulluch (2008) has suggested that even though the EW intervention did not result in an alleviation of PTSD-related symptoms in a group of formally diagnosed PTSD participants, it did demonstrate that EW was safe, feasible, and it resulted in improvements in other mood variables (e.g., anger, tension, depression), as well as participants’ ability to regulate
their emotional reactions after writing (as measured by cortisol reactivity when exposed to the traumatic memories).

Recent research suggests that EW studies are demonstrating significant decreases in psychological symptoms more consistently and more robustly than past research. Specifically, the work by Denise Sloan and her colleagues (e.g., Epstein, Sloan, & Marx, 2005; Sloan & Marx, 2004a; Sloan, Marx, & Epstein, 2005; Sloan, Marx, Epstein, & Dobbs, 2008; Sloan, Marx, Epstein, & Lexington, 2007) has shown that, despite much inconsistency in the literature in terms of how effective the EW intervention is in alleviating psychological distress, the college participants in their studies have repeatedly demonstrated significant improvements on symptoms of PTSD, depression, physical health complaints, as well as physiological indices of stress (e.g., cortisol levels and heart rate). Although Sloan and her colleagues have commonly utilized a healthy student population for their EW studies, they normally require that participants endorse having experienced a traumatic event that continues to cause at least a moderate amount of psychological distress (commonly measured by scoring 10 or above on the Posttraumatic Stress Diagnostic Scale; Foa, 1995).

Furthermore, a meta-analysis by Frattaroli (2006) examined the effectiveness of the EW intervention in 146 different studies, and is important to review before proceeding. The advantage of Frattaroli using a random-effects approach in her meta-analysis, is that “one can have confidence in the true existence of this effect even for similar studies that were not included in the present analyses as well as for similar studies that might be conducted in the future” (p. 851).

The results of Frattaroli’s (2006) meta-analysis suggest that EW is a beneficial activity with an overall (unweighted) $r$-effect size of .075. Although the effect size found in Frattaroli’s
meta-analysis was smaller than that of the Smyth’s (1998) and Frisina and colleague’s (2004) meta-analyses, possibly due to its use of a number of unpublished studies, Frattaroli concludes that the effect should still be considered significant and that EW be viewed as a worthwhile and beneficial activity. Frattaroli alludes to a number of rationales that support this conclusion. First, she argues that the costs and benefits of a particular intervention should be taken into account when examining its practical importance, instead of merely relying on Cohen’s (1988) conventions for effect sizes. In terms of the EW intervention, it appears as if there are little costs associated with the intervention, as it is free, quickly administered, can be completed independently, is non-invasive, and is viewed by participants to be quite helpful. As such, it seems that any intervention that has some benefit, no matter how small these benefits may be, is worth acknowledging and utilizing if there are little or no costs associated with it; an argument espoused by others as well (Glass, McGaw, & Smith, 1981; Prentice & Miller, 1992).

Additionally, when gauging the benefits of the EW intervention, Frattaroli (2006) recommends that it is important to examine other effect sizes in related research domains, such as the fields of medicine, education, and clinical psychology. For instance, in the medical literature researchers have recommended taking a daily aspirin after having a heart attack in order to prevent any further heart related complications. This recommendation is based on findings with an $r$-effect size of .034 (Rosenthal, 1994), which is only half of the effect size found for the EW intervention. Similarly, in terms of acceptable effect sizes that have been shown to influence educational decisions and policy making, it has been suggested that effect sizes as small as .050 be regarded as important (Lanahan, McGrath, McLaughlin, Burian-Fitzgerald, & Salganik, 2005).
Moreover, because the EW intervention is viewed as a psychotherapeutic intervention, Frattaroli (2006) argues that it is important to compare its effect size to that of psychotherapy. A meta-analysis conducted by Smith and Glass (1977) of hundreds of studies on psychotherapy effectiveness cited an $r$-effect size of approximately .322. Additionally, more recent meta-analyses of general therapeutic effectiveness have demonstrated effect sizes that range from .22-1.05, with a particular meta-analysis (17 studies) examining therapy effectiveness with PTSD demonstrating a weighted effect size of .52 (see Lambert & Ogles, 2004, for a review). Although the EW intervention effect size has been shown to be much lower than this, it is not surprising given that psychotherapy involves forming a therapeutic relationship with a trained professional and meeting with them usually for one hour per week on an ongoing basis. It is important to mention that although the EW intervention has been shown to have the potential to benefit the psychological and physical health of people who write emotionally about their traumatic experiences, the argument is not being made that EW is equivalent to psychotherapy in terms of how effective it is, or that it should be used as a replacement for psychotherapy. However, some researchers have suggested utilizing the EW intervention as an adjunct to therapy, perhaps assigning it as homework to further facilitate psychological improvements (Bolton et al., 2004; Graf et al., 2008; Leahy, 2003; Lepore & Smyth, 2002b; Resick & Calhoun, 2001).

A final piece of evidence to support the claim that the EW intervention is helpful despite the small overall effect sizes reported involves the less than optimal conditions under which the EW intervention is sometimes administered (Frattaroli, 2006). Within her meta-analysis, Frattaroli was able to investigate a number of moderators due to the large amount of studies included. Although moderating variables will be reviewed later on in this paper, it is important to mention an analysis that was conducted on eight studies that were considered to involve optimal
methodological conditions (e.g., high dosage of writing sessions, privacy during writing, and the use of specific writing instructions). When examining the eight studies that involved these optimal conditions, Frattaroli found an average effects size of .20, offering preliminary support for the idea that, when offered under the right conditions, the EW intervention will have quite significant effects on peoples’ psychological health, physical health, and general functioning.

**General Overview of Moderating Variables**

**Within the Expressive Writing Literature**

As a result of the inconsistent findings found within the literature, researchers have turned their attention to examining when and for whom the EW intervention works best, and have attempted to investigate potential moderators (Baikie, 2008; Baikie & Wilhelm, 2005; Frattaroli, 2006; Harris, 2006; Kraft, Lumley, D’Souza, & Dooly, 2008; Lepore & Smyth, 2002b; Lewis et al., 2005; Norman, Lumley, Dooley, & Diamond, 2004; Paez, Velasco, & Gonzalez, 1999; Smyth, 1998; Smyth, Anderson, Hockemeyer, & Stone, 2002; Smyth & Pennebaker, 2008; van Middendorp & Geenen, 2008). Instead of reviewing individual studies, many of which have demonstrated equivocal findings, it is more prudent to examine the meta-analysis by Frattaroli (2006), which conducted a thorough moderation analysis on 146 randomized studies of written emotional disclosure.

Frattaroli (2006) examined the following between-study moderating variables in the first phase of her analysis: publication status, inclusion criterion (e.g., physical health problem, trauma stressor history, college student, and psychological health problem), setting variables (e.g., location of disclosure and privacy when disclosing), demographic variables (e.g., sex, age, educational history, and ethnicity), methodological variations (e.g., number of participants, whether reimbursement was provided, informing clients about the writing requirement during
screening, and length until follow-up session), treatment variables (e.g., number of disclosure sessions, length of disclosure sessions, negative versus positive writing topic, months since traumatic event occurred, prior disclosure of traumatic event, specificity of writing instructions, topic switching allowed or disallowed, focus of disclosure on emotions versus cognitive change, writing about current versus past traumatic events, audience/no audience while disclosing, written versus verbal disclosure, and either writing or typing the disclosure), and study quality information (e.g., study quality rating, attrition rate, administering instructions orally or in writing, using standard control group versus other, and expectancy effect).

Frattaroli (2006) concluded that, in comparison to unpublished studies, published studies were associated with significantly greater overall benefits ($r = .144, p = .042$), reported physical health benefits ($r = .204, p = .024$) and marginally greater subjective impact on participants (e.g., they expressed greater enjoyment; $r = .238, p = .091$). Additionally, significantly greater physical health benefits were found for studies that required a physical health selection inclusion criteria ($r = .188, p = .034$) and marginally greater subjective impact was found for studies that required participants to have a history of traumatic events or significant stressors ($r = .244, p = .086$). In comparison to college samples, studies that included participants from the general population demonstrated marginally greater psychological health benefits ($r = -.173, p = .067$); a finding which is in contrast to the results described by Smyth (1998) in his meta-analysis. Also, the disclosure setting was found to be a significant moderator, with those disclosing at home, as opposed to a research office, demonstrating significant improvements in terms of psychological health ($r = -.250, p = .012$). Having a private writing session, as opposed to writing in the presence of others, was also related to significantly greater overall improvements ($r = .147, p = .04$) and psychological health benefits ($r = .167, p = .039$).
In terms of methodological and treatment variables found to be significant moderators, Frattaroli (2006) surprisingly concluded that studies with a smaller sample size resulted in marginally greater psychological health benefits ($r = -0.181, p = .058$). Moreover, using follow-up sessions of less than 1 month was shown to result in marginally greater overall improvements ($r = 0.139, p = .095$) and significantly greater psychological health benefits ($r = 0.213, p = .024$).

Furthermore, studies that used at least three writing sessions demonstrated marginally greater overall improvements ($r = 0.108, p = .098$), psychological health benefits ($r = 0.135, p = .078$), and greater subjective impact ($r = 0.237, p = .092$) in comparison to studies using less than three writing sessions. Length of the disclosure sessions was also found to be a significant moderating variable with longer sessions (i.e., at least 15 minutes) resulting in greater overall improvements ($r = 0.148, p = .03$) and reported health benefits ($r = 0.214, p = .018$).

It was also discovered that writing about more recently occurring events resulted in significantly greater overall improvements ($r = -0.283, p = .013$), psychological health benefits ($r = -0.323, p = .012$), and reported physical health benefits ($r = -0.289, p = .040$) in comparison to events that occurred in the distant past. Prior sharing with others about the traumatic event was also found to be a marginally significant moderating variable, such that greater psychological benefits existed when participants had lower levels of previous sharing about the traumatic event ($r = 0.151, p = .06$). Specificity of writing instructions and providing more examples within the instruction set was found to result in marginally greater overall improvements ($r = 0.136, p = 0.055$) and significantly greater psychological health benefits ($r = 0.257, p = 0.0035$).

Additionally, studies that designated whether topic switching was allowed or disallowed across writing sessions resulted in marginally greater psychological health benefits ($r = 0.133, p = 0.084$) than studies that did not specify this. The audience present during the writing or knowing
that someone would read the writing also appeared to influence psychological health outcomes, with private disclosures resulting in marginally greater psychological health improvements \((r = .172, p = .075)\) than studies that had participants write in the presence of the experimenter or fellow participants, or those studies that had participants submit their essays for review after the completion of writing. In terms of the quality of the study, the results surprisingly demonstrated that studies rated as having lower study quality resulted in significantly greater psychological benefits \((r = -.188, p = .048)\). Also, studies that created unequal expectations about improvement for EW and control participants demonstrated significantly greater overall improvement \((r = .199, p = .016)\) and psychological health benefits \((r = .289, p = .002)\).

In the second phase of Frattaroli’s (2006) meta-analysis, she examined a number of within-study moderators (individual difference variables), including age, gender, and level of stress, mood, neuroticism, alexithymia, optimism, and emotional inhibition. The results of this analysis demonstrated that participants reporting higher levels of stress had significantly greater overall improvements \((mean \ r = .102, p = .018)\) and reported health benefits \((mean \ r = .187, p = .0012)\). Similarly, those who reported having greater difficulties with their physical health demonstrated marginally greater reported health benefits \((mean \ r = .102, p = .089)\). Moreover, in comparison to optimists, those participants classified as pessimists were shown to experience significantly greater psychological health benefits \((mean \ r = .340, p = .016)\) and marginally greater reported physical health benefits \((mean \ r = .157, p = .097)\). Although no significant or marginally significant moderator effects were found for mood, alexithymia, and emotional inhibition, Frattaroli concludes that these null effects should be interpreted cautiously for two reasons. First, given only a small number of studies have been completed that examine these particular individual differences as potential moderating variables, it is more difficult to detect
significant effects. Second, many studies failed to provide statistics when no moderating interaction was found. As a result, Frattaroli was forced to estimate the effect size as zero; a very conservative approach which may have minimized the chances of detecting significant effects.

It is interesting to note that Frattaroli (2006) did not demonstrate a significant moderating effect for sex of participants. These findings contradict the results from a previous meta-analysis by Smyth (1998), which demonstrated that EW studies with more men resulted in higher overall effect sizes. The prediction that men would benefit more from EW than women is rooted in inhibition theory (Pennebaker, 1989, 1997; Pennebaker & Beall, 1986). This theory is based on the idea that the inhibition of thoughts and emotions can be harmful for both psychological and physical health. As a result, an emphasis is placed on the cathartic release of previously inhibited emotions in order to achieve emotional and physical well-being. It has been argued that Western culture tends to discourage men from engaging in the interpersonal expression of their emotions (Frattaroli, 2006), and as a result, it is believed that men would benefit more from EW intervention than woman given the limited opportunities they receive to express their emotions (Smyth, 1998). Despite these claims, the results are mixed in terms of the support for the inhibition theory and the moderating effect of gender, with the majority of the research suggesting that level of previous disclosure and the sex of the participant has no significant impact on the effectiveness of the EW intervention (see Frattaroli, 2006; Sloan & Marx, 2004b, for a review).

According to Smyth and Pennebaker (2008), currently “there is no clear picture of which personality or individual difference dimensions may moderate expressive writing” (p. 3). As such, one of the main purposes of the current study was to examine whether a person’s ability to regulate his or her emotions influences how beneficial the EW intervention is. As will be
described shortly, support for the moderating effects of emotion regulation within the EW intervention has been drawn from the EW literature as well as psychotherapy process research.

**General Overview of the Mediating Variables**  
**Within the Expressive Writing Literature**

In addition to recent attempts to delineate who the EW intervention works best for (i.e., moderating variables), a continuing puzzle remains in the EW literature as to how and why EW works (i.e., the mechanisms of action or mediating variables). A myriad of theories have been posited, and a number of review articles and chapters are helpful in understanding the specifics of each theory and the empirical support (or lack thereof) that exists for each (Kennedy-Moore & Watson, 1999; Lepore & Smyth, 2002b; Pennebaker, 1997, 2004; Sloan & Marx, 2004b; Smyth, Nazarian, & Arigo, 2008).

For instance, some of the more commonly mentioned mechanisms include decreasing the physiological work associated with emotional inhibition through a form of catharsis (Pennebaker, 1989, 1997; Pennebaker & Beall, 1986), forming a narrative of the traumatic events which strengthens cognitive-emotional integration and further facilitates the creation of meaning (Park & Blumberg, 2002; Pennebaker & Seagal, 1999; Smyth, True, & Souto, 2001), being exposed to feared memories or thoughts and habituating the fear/anxiety response (Bootzin, 1997; Kloss & Lisman, 2002; Sloan & Marx, 2004a; Sloan et al., 2005), increasing self-understanding or gaining insight into a problem or past traumatic event (Kennedy-Moore & Watson, 1999; Pennebaker, 1993a, 1993b; Pennebaker & Francis, 1996), enhancing and facilitating positive emotional reflection (Kennedy-Moore & Watson, 1999; King, 2001; King & Miner, 2000), improving interpersonal interactions and access to social support (Kennedy-Moore & Watson, 1999; Pennebaker & Graybeal, 2001), and increasing an individual’s ability to
regulate their emotions and behaviour (Byrne-Davis et al., 2006; Kennedy-Moore & Watson, 1999; King, 2001, 2002; King & Miner, 2000; Smyth, Nazarian, et al., 2008).

After evaluating the theories underlying the EW paradigm, along with the inconsistent empirical support that exists for each theory, Sloan and Marx (2004b) have recently concluded that no single theory appears to account for the effectiveness of the EW intervention. To support this claim, even James Pennebaker (2004), in a commentary of the Sloan and Marx (2004b) article admits that, “most likely, there was never any reasonable hope of uncovering a single theory or mediating process to explain the power of writing” (p. 138). He goes on to offer a number of reasons for this dilemma including the major differences in the populations being studied (e.g., differences in age, gender, ethnicity, diagnoses, sick versus healthy, distressed versus not distressed), the differences in the writing topics (e.g., past traumatic childhood experiences to ongoing current stressors), and a myriad of different outcome measures being used that measure vastly different emotions, symptoms, and behaviours. Additionally, Pennebaker (2004) suggests that the lack of one single theoretical explanation is also due to the fact that the EW intervention impacts people on a variety of levels and in many different ways. Specifically, he argues that numerous emotional and cognitive changes occurring both in the short-term and the long-term likely influence and interact with various social and biological processes, making a single explanatory theory improbable.

For these reasons, the objective of the current study was not to provide an unequivocal answer to this question and suggest that only one mechanism of action exists. However, as a secondary aim we examined whether greater increases in a person’s emotion regulation abilities are one of the many possible reasons why people who engage in the EW intervention experience psychological and physical health benefits. Before reviewing the potential moderating and
mediating effects of emotion regulation, it is important to understand the concepts of emotional experience, emotional expression, and emotion regulation in the context of a theoretical framework.

**Theoretical Framework:**
**A Model of Emotional Expression**

Emotions are derived from a number of sources, including various neurochemical, physiological, biopsychosocial, and cognitive systems (Izard, 1991, 1993). It has been suggested that emotions arise out of an ongoing constructive process which involves synthesizing affective, cognitive, motivational, and sensorimotor sources of information in order to determine emotional experience and influence action (Bernard & Teasdale, 1991; Greenberg & Paivio, 1997; Greenberg, Rice, & Elliot, 1993; Watson & Greenberg, 1995). While many levels of information processing are being synthesized to produce a feeling into awareness, a continuing process of integrating emotion and reason also occurs. This process involves consciously attending to a bodily felt sense, symbolizing this experience further into awareness, and reflecting on it in order to create new meaning and direct behavior (Greenberg, 2002; Greenberg & Paivio, 1997).

Emotions have many purposes, including a number of interpersonal and intrapersonal functions (Frijda, 1986). One role of emotions is that they inform us of our goals, needs, and priorities, which in turn helps organize and prepare us for action (Elliot et al., 2004; Greenberg, 2002). Emotions also contribute to increasing motivation in two ways (Greenberg & Paivio, 1997). First, through their associated physiological responses and action tendencies, they prompt people to confront and deal with emotion eliciting events. Second, emotions such as joy and happiness are frequently sought after as rewards in themselves, motivating people to engage in certain behaviours or interactions in order to increase the probability of experiencing these
emotions. Furthermore, emotions are considered adaptive because they are responsible for regulating our attention to relevant events that can be important and helpful to address. This is accomplished because emotions act as an alarm and bring into conscious awareness these important events when they arise (Greenberg, 2002; Greenberg & Paivio, 1997).

Another function of emotion involves its role in memory and cognitive processes, given the research suggesting that emotions influence what people remember, think, and do (Blaney, 1986; Isen, 1984). Moreover, emotions provide us with a “sense”, or “gut feeling”, which can be relied on to either direct adaptive behavior or steer us away from potentially negative or undesirable courses of action (Greenberg & Paivio, 1997). Finally, emotions play a major role in interpersonal interactions and communication as they provide information to others about our intentions and readiness to act (Fridja, 1986; Greenberg, 2002; Greenberg & Paivio, 1997). In addition to verbally expressing our emotions to others, people constantly send and receive signals through facial expression, which has been shown to significantly inform and regulate interpersonal interactions (Greenberg & Johnson, 1988).

Emotional expression has been referred to as “the link between internal experience and the outside world” (Kennedy-Moore & Watson, 1999, p. 4). Expressing emotions in a context-appropriate manner is a remarkably adaptive skill of emotional intelligence that involves being able to assimilate and manage the contributions from both the biological system and cultural/societal norms (Greenberg, 2002). Increased attention to the importance of expressing emotions has emerged from the work on emotion theory and is a technique commonly encouraged in psychotherapeutic settings (Elliot et al., 2004; Greenberg & Paivio, 1997; Greenberg & Safran, 1987; Kennedy-Moore & Watson, 1999).
The expression of emotion has been described as being both adaptive and maladaptive (Greenberg, 2002; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999). For instance, some theorists argue that the ability to refrain from expressing emotions is virtuous and indicates strength and maturity. Empirical evidence in support for this claim demonstrates that expression can sometimes intensify emotional distress (Laird, 1974; Lanzetta, Cartwright-Smith, & Kleck, 1976), hinder active coping efforts (Carver, Scheier, & Weintraub, 1989; Nolen-Hoeksema, 1991), and have a negative impact on interpersonal relationships when expression becomes impulsive and unrestrained (Tavris, 1984, 1989).

On the other hand, a number of theorists believe that people must express their emotions. For instance, those that espouse a hydraulic model of emotional expression posit that humans are akin to boiling pots and that when negative emotions become “too hot” it is necessary to release them through expression in order to prevent them from being manifested in physical and psychological problems (Gross, 1998a; Kosmicki & Glickauf-Hughes, 1997; Nichols & Efran, 1985; Straton, 1990). This particular hypothesis has become known as the “venting hypothesis” (Kennedy-Moore & Watson, 1999) and has inspired therapeutic work found within many psychotherapeutic orientations, including psychodynamic, behavioural, and experiential therapy (Nichols & Efran, 1985).

Although the venting hypothesis purports that it is the quantity of expression that leads to psychological and physical health benefits, Kennedy-Moore and Watson (1999) suggest that it is the quality of expression, and not the quantity of expression, that is the determining factor in how successful emotional expression is in alleviating distress. They argue that the “expression of negative feelings is adaptive to the extent that it leads to some kind of resolution of distress” (p. 26). According to Kennedy-Moore and Watson (1999), productive expression of emotions
involves being able to gain insight and greater understanding through the experiencing of emotions while at the same time not becoming overwhelmed by these emotions. Moreover, they posit that productive emotional expression involves being able to utilize the energy provided by emotions to carefully plan for action as opposed to being aimlessly driven or paralyzed by them. Another indication of productive emotional expression involves being able to delicately communicate emotional experience to others in a manner that improves interpersonal functioning and relationships as opposed to damaging them (Kennedy-Moore & Watson, 1999).

Greenberg (2002) adds to this argument by suggesting two additional factors that help determine whether emotional expression is beneficial. First, the “newness” or “freshness” of the emotion being expressed is important to consider. If an individual is expressing emotions that were once blocked, or that are newly acknowledged, it is believed that this would have a higher likelihood of being a productive form of expression (Greenberg, 2002). However, the expression, or venting, of a pre-existing emotion that has been expressed repeatedly in the past without any resolution may not be beneficial and will not likely lead to any reduction in expression moving forward (Bushman, Baumeister, & Stack, 1999). Secondly, Greenberg (2002) posits that expression alone does not lead to benefits because a distinction needs to be made between expression as a sign of distress, and expression as a sign of resolving distress. The latter, which signifies a process of change or resolution, is a form of expression that has a higher probability of leading to positive changes (Kennedy-Moore & Watson, 1999).

Kennedy-Moore and Watson (1999) have outlined a process model of emotional expression and discuss how the successful process of expressing emotions can be beneficial to humans. In the proposed model, it is argued that there exist a series of five cognitive-evaluative steps that are driven by emotional experience, and that disruptions at each step of the process can
thwart successful expression of emotions. Given the EW intervention is a form of emotional expression (Lepore & Smyth, 2002a), this particular model is important to cover. Additionally, many of the steps outlined in the model of emotional expression dovetail nicely with our definition of emotion regulation, which will be reviewed shortly.

Step one of the model involves a “prereflective reaction to an emotion-eliciting stimulus” (p. 9). This reaction entails a perception of the emotionally arousing stimulus, some form of preconscious cognitive and emotional processing, and a physiological response in the body that signals that something significant merits attention, and potential action. According to Kennedy-Moore and Watson (1999), disruptions at this step can result if a person has a high threshold for reacting to emotionally arousing triggers and appraises a stimulus as benign or irrelevant. Support exists for this variability in responding, as research demonstrates that individuals vary in their level of emotional response and physiological arousal when exposed to the same stimuli (Larsen & Diener, 1987). A block at this stage of the model is not detrimental, and according to the authors, may in fact be adaptive and indicative of a well-adjusted person who does not easily become “ruffled” by life events (Kennedy-Moore & Watson, 1999).

Step two in the process model involves a motivated lack of awareness of emotions, which is said to be maladaptive because it prevents an individual from using their emotional experience as a guide and is akin to “going through life blindfolded” (Kennedy-Moore & Watson, p. 15). For instance, if a person is able to recognize that a particular stimulus warrants attention, they may implement an emotional defensiveness or repressive coping style to avoid acknowledging the negative emotional reaction. This tendency can either be dispositional and used in many situations, similar to the repressive coping style outlined by Weinberger and his colleagues (Bonanno & Singer, 1990; Newton & Contrada, 1992; Weinberger, 1990), or it may only be
applied to situations that the person finds particularly sensitive and important. Either way, the motivated lack of awareness blocks the process of emotional expression, leading to an inability to progress through the subsequent stages that would help a person address, understand and act on their emotions (Kennedy-Moore & Watson, 1999; Lumley, Tojek, & Macklem, 2002).

Step three of the model involves the ability to symbolize, label, and interpret the affective response to a stimulus. Deficits in emotional processing such as these are characteristic of a personality style referred to as alexithymia (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994; Taylor, Bagby, & Parker, 1991, 1997), and they limit a person’s ability to differentiate and understand their feelings. According to the Kennedy-Moore and Watson (1999), not being able to interpret and understand feelings makes it difficult for a person to use their emotions as a guide to more productive coping strategies and circumvents emotional expression because of difficulties putting their experience into words.

Assuming a person is able to symbolize, understand, and label their affective responses, expression of their emotions may be prevented if the person evaluates their emotional response in a negative way (step four). If a person views their emotional response as either unacceptable or shameful they will likely choose to keep their emotional experience to themselves and opt against expressing their emotions fully. This may result from a global negative attitude towards the expression of emotions (Allen & Hamsher, 1974; Joseph, Williams, Irwing, & Cammock, 1994). Similarly, if a person views their emotional response as frightening, dangerous, or overwhelming, they may attempt to avoid or consciously suppress their emotions; once again, this is a strategy which would hinder their ability to successfully experience, process, and express their emotions (Kennedy-Moore & Watson, 1999). As such, it is necessary that the
person view their emotions as acceptable and safe before they are able to successfully express them. 

Finally, even if a person views their emotional reaction as acceptable and safe, it is crucial that the person feel as if they have the appropriate social context and interpersonal relationships to express their emotions. Research suggests that having a social support network and someone to confide in is crucial in promoting well-being (Brown & Harris, 1978; Cohen & Wills, 1985; Sarason, Sarason, & Pierce, 1990). It has been suggested that a block at this step of the model is particularly distressing when a person has limited access and opportunity to express their emotions, but they possess a strong desire and need to share (Kennedy-Moore & Watson, 1999; Pennebaker, 1992). 

It is important to note that although this model of emotional expression has been laid out in a series of discrete and sequential steps, expression does not necessarily unfold in such a linear fashion (Kennedy-Moore & Watson, 1999). For instance, many people who have difficulties containing their emotions tend to express them without much, if any, processing (Epstein, 1990; LeDoux, 1989, 1996). Furthermore, people rarely just process their emotional experience once and proceed to expressing it. Instead, they tend to express their emotions repetitively, gaining increased insight and understanding of their emotional experience each time they evaluate and reflect on their emotions (Kennedy-Moore & Watson, 1999; Rime, Mesquita, Philoppot, & Boca, 1991). According to experiential theorists, different forms of emotional processing occur at each of these five steps. Therefore, successfully progressing through these steps of emotional expression is an important goal in experiential therapies that is encouraged by therapists in order to promote deeper emotional processing (Elliot et al., 2004; Kennedy-Moore & Watson, 1999) and greater gains in therapy (Watson, McMullen, Prosser, & Bedard, 2011).
Theoretical Framework:
A Model of Emotion Regulation

In the past three decades, research in the field of psychology has begun to focus explicitly on the topic of emotion regulation in order to address how people manage their emotions, as well as what unfolds when they are unsuccessful in doing so (Bradley, 2000; Garber & Dodge, 1991; Gross, 1998b, 2007; Vingerhoets, Nyklicek, & Denollet, 2008). According to Greenberg (2002, p. ix), humans “have long been unsure of how to handle their emotionality and are given remarkably little explicit tutoring in this complex task”.

There are a number of etiologies of emotion dysregulation suggested in the literature (Bradley, 2000; Garber & Dodge, 1991; Gross, 2007; McMain, Korman, & Dimeff, 2001). For instance, it is posited that some people have a biological predisposition to feeling anxious, overaroused, and having difficulties getting back to a state of homeostasis and balance. The idea that emotion regulation develops as a result of biological and genetic factors has been espoused by many researchers (Bradley, 2000; Calkins, Fox, & Marshall, 1996; Calkins & Hill, 2007; Davidson, Fox, & Kalin, 2007). Additionally, difficulties in emotion regulation have also been tied to insecure attachment patterns, which develop through relationships with caregivers (Bradley, 2000; Calkins & Hill, 2007), having an invalidating environment where parents trivialize, ignore, dismiss or even punish emotional reactions (Bradley, 2000; Thompson & Meyer, 2007), and the experiencing of a traumatic event or ongoing traumatic stressors (Bradley, 2000; Elliot et al., 2004; McMain et al., 2001). Although some researchers argue for a purely biological etiology versus a developmental one, it has been concluded that it is a combination of psycho-social-biological factors that contribute to emotion regulation difficulties (see Gross, 2007, for a review).
An abundance of definitions of emotion regulation are available in the literature (Bradley, 2000; Denollet et al., 2008; Elliot et al., 2004; Greenberg & Paivio, 1997; Gross, 1998b, 2007; Thompson, 1994; van Dijke, 2008), but only one will be reviewed here. According to a model of emotion regulation articulated by Watson and her colleagues (Elliot et al., 2004; Greenberg, 2002, 2004; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999), emotion regulation is “defined as how people process, modulate, and express their emotional experience” (Watson et al., 2011, p. 86). Watson and her colleagues (Elliot et al., 2004; Greenberg, 2002, 2004; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999; Watson et al., 2011) posit that emotion regulation is grounded in the ability to be aware of our emotions, through attending to our bodies where emotional experience is registered. Once a person gains awareness of their emotional experience, Watson and her colleagues suggest that a person must then be able to symbolize, differentiate, and label their experience. Through a process of integrating the emotional system with the cognitive/rational system, reflection on their experience allows for the individual to begin to make sense of it, accept it, and understand their needs, desires, goals and priorities. While this ongoing process is underway, a person must also know how to modulate their arousal and behaviour. This may be accomplished by distracting themselves or avoiding particular situations, and then coming back to address the distressing feelings and situations when they feel more resilient. It may also involve utilizing many self-soothing strategies in order to alleviate arousal and distress and minimize the likelihood of engaging in impulsive or destructive behaviours. Modulation of emotional expression is another important component of the emotion regulation model articulated by Watson and her colleagues, in that a person must know when, how, what, and to whom they should express their emotions. Difficulties may arise if a person is unable to modulate their expression, especially if they tend to express their
emotions impulsively to others in an unrestrained manner. In reflecting on their ever changing experiences, emotions, and behaviours, a person is better able to understand and make sense of things, and thus it facilitates their ability to distinguish what they need or desire, and whether any modifications in their behaviour or mode of expression need to be made in order to achieve these end states.

For the purposes of the current study we have defined emotion regulation abilities based on a number of facets that make up the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Further, we will ground our hypotheses in the framework of the emotional expression process model articulated by Kennedy-Moore and Watson (1999) and the emotion regulation model described by Watson and her colleagues (Elliot et al., 2004; Greenberg, 2002, 2004; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999; Watson et al., 2011). The DERS is a 36-item self-report questionnaire that measures a variety of clinically relevant difficulties in emotion regulation that are frequently seen in clinical settings and that are commonly reported in the literature (Sloan & Kring, 2007). The DERS is comprised of six distinct, yet related factors of emotion regulation difficulties, including: an inattention to or a lack of acknowledgement of emotions and emotional responses, a lack of emotional clarity about emotional experience, the nonacceptance or negative secondary emotional responses to emotional distress and emotions, difficulties engaging in goal directed behaviour when experiencing negative emotions, difficulties with impulse control when experiencing negative emotions, and a limited ability to generate and implement emotional regulation strategies.

As can be seen by the description of the scales on the DERS, the emotion regulation model articulated by Watson and her colleagues, as well as the model of emotional expression outlined by Kennedy-Moore and Watson, map on to this particular measure quite nicely. Now
that we have defined what we mean by emotion regulation, it is important to review the psychotherapy process and outcome literature as well as the EW literature in order to examine the potential moderating role of emotion regulation.

**Emotion Regulation and Psychotherapy:**

**Support for the Moderation Hypothesis**

It is commonly accepted that many psychological disorders involve difficulties with regulating emotions. For instance, research shows that poor emotion regulation is implicated in various anxiety and mood disorders (Campbell-Sills & Barlow, 2007), including depression (Greenberg & Watson, 2006) and PTSD (Ford & Kidd, 1998; Wolfsdorf & Zlotnick, 2001). Difficulties regulating emotions has also been implicated in borderline personality disorder (Glenn & Klonsky, 2009; Linehan, 1993), bulimia (Stice, 1999), binge eating (Whiteside et al., 2007), externalizing aggressive behaviours (Cohn, Jakupcak, Seibert, Hildebrandt, & Zeichner, 2010; Mullin & Hinshaw, 2007) as well as various forms of disordered substance use (Bonn-Miller, Vujanovic, & Zvolensky, 2008; Fox, Axelrod, Paliwal, & Sinha, 2007; Fox, Hong, & Sinha, 2007).

Given the extensive influence that emotion dysregulation has on psychological difficulties, psychotherapies of differing orientations have attempted to develop and improve emotion regulation abilities (Berenbaum, Raghaven, Le Vernon, & Gomez, 2003; Elliot et al., 2004; Greenberg, 2002; Greenberg & Paivio, 1997; Gross, 1998b; Linehan, 1993; McMain et al., 2001; Sloan & Kring, 2007; Wolfsdorf & Zlotnick, 2001; Zlotnick et al., 1997). However, if not addressed adequately and worked on within therapy, an inability to successfully regulate emotions has the potential to disrupt functioning, can interfere with the successful development of the therapeutic relationship, and can impede progress in psychotherapy (Elliot et al., 2004;
Greenberg, 2002; Greenberg & Paivio, 1997; Hembree, Rauch, & Foa, 2003; Kennedy-Moore & Watson, 1999; Wiser & Arnow, 2001; Wolfsdorf & Zlotnick, 2001). Reviewing this line of psychotherapy outcome research is important, as it lends support to our hypothesis that difficulties with emotion regulation will also hinder progress within the EW intervention.

There are two types of emotion regulation difficulties that are of practical importance for treatment-related progress (Paivio & Laurent, 2001), and these are captured by the DERS and our definition of emotion regulation. First, the under-regulation of emotion involves feeling overwhelmed by emotions, feeling overaroused, being unable to control self-destructive impulsive behaviours, and engaging in aggressive acts, provocative and risky sexual behaviour, or suicide attempts. In contrast to this, the over-regulation of emotions is characterized by feelings of numbness, and lacking insight and the ability to analyze and express emotions. If a client is underaroused, they may feel numb and out of touch with their emotional experience, and may have a difficult time identifying and expressing intense emotional experiences (Elliot et al., 2004; Linehan, 1993; Paivio & Laurent, 2001, Wiser & Arnow, 2001). Evidence from the psychotherapy process literature suggests that those with poor emotion regulation abilities do not benefit as much from therapy in comparison to those who have better emotion regulation skills and strategies.

For instance, Watson, Goldman, and Greenberg (2007) have demonstrated that emotion regulation abilities distinguished between poor and good outcome cases in process-experiential therapy for depression. More specifically, a review of good outcome cases indicated that clients who improved more in this emotion-focused treatment for depression valued their emotions, and were able to reflect on their emotional experience in order to resolve problematic issues in therapy. In contrast to this, an analysis of poor outcome cases demonstrated that these clients had
difficulties being aware of their emotions, labeling them, and lacked the ability to successfully modulate their emotional experience. These results are consistent with past research demonstrating that greater depth of emotional processing within therapy is related to more positive outcome (Costonguay, Goldfried, Wiser, Raue, & Hayes, 1996; Pos, Greenberg, Goldman, & Korman, 2003; Stanton et al., 2000; Watson & Bedard, 2006; Whelton, 2004).

Furthermore, Watson and colleagues (2011) have recently attempted to examine the relationship between clients’ emotion regulation abilities, in-session emotional processing, and outcome using an observer rater measure of emotion regulation. The O-MAR (Watson & Prosser, 2004, as cited in Watson et al., 2011) assesses emotion regulation abilities along the following five subscales of emotional processing that dovetail nicely with our definition of emotion regulation:

1. Level of awareness,
2. Modulation of arousal,
3. Modulation of expression,
4. Acceptance of affective experience, and
5. Reflection on experience.

Based on their findings, Watson and colleagues (2011) conclude that clients’ initial capacity for affect regulation influences how they engage with their emotional experience in the session, and that the quality of their emotional processing or engagement in the session, particularly their capacity to reflect on their emotional experience to resolve issues, predicts changes in their capacity to regulate their affect at the end of therapy as well as improvement in depression, self-esteem, dysfunctional thoughts, interpersonal problems, and the number of complaints and symptoms at the end of a short-term therapy for depression. (p. 93)
According to van Dijke (2008), difficulties with emotion regulation are commonly found in individuals referred to as alexithymic (Taylor et al., 1997) and research has shown that highly alexithymic individuals have difficulties engaging in and benefiting from therapy (Lumley, Beyer, & Radcliffe, 2008). According to Taylor and colleagues (1997), alexithymic individuals experience difficulties identifying and labeling their emotions and tend to use an externally-oriented thinking style which lacks a connection with their emotional experience.

Many studies demonstrate that those who score high on the trait of alexithymia demonstrate poorer outcomes in the treatment of depression (Ogrodniczuk, Piper, & Joyce, 2004), alcoholism (Cleland, Magura, Foote, Rosenblum, & Kosanke, 2005), a variety of mixed psychiatric disorders (McCallum, Piper, Ogrodniczuk, & Joyce, 2003), complicated grief (Ogrodniczuk, Piper, & Joyce, 2005) as well as functional gastrointestinal disorders (Porcelli, Bagby, Taylor, DeCarne, Leandro, & Todarello, 2003). However, not all evidence supports this conclusion. For instance, research has demonstrated that alexithymia is unrelated to outcome in the treatment of obsessive-compulsive disorder with cognitive-behavioural therapy (Rufer et al., 2004), relaxation training for stress and anxiety (Friedlander, Lumley, Farchione, & Doyal, 1997), as well as a behavioural management treatment aimed at addressing symptoms of psoriasis (Fortune, Richards, Griffiths, & Main, 2004). Moreover, contrary to our prediction, some studies have also demonstrated that higher levels of alexithymia were associated with greater improvements in clients participating in a group treatment for substance use (Rosenblum et al., 2005) and were predictive of clients remaining longer in a cognitive-behavioural smoking cessation group (Lumley, Downey, Stettner, Wehmer, & Pomerleau, 1994).

Although these studies have suggested equivocal findings exist within the literature, they do lend some support to the idea that greater emotion regulation abilities predict greater
improvements in psychotherapy outcome. Since a client’s ability to regulate their emotions has been suggested to predict their success in therapy, it is possible that such a relationship would exist with the EW intervention. However, Lumley and his colleagues (2002) have argued that “it appears to be quite common for researchers to use less rigorous methods to explore individual difference moderators of disclosure” (pp. 78-79) and have recommended that moderation hypotheses be tested by examining an aptitude by treatment interaction. As a result, attention will be paid to studies that have utilized such an approach when reviewing the research that attempts to address the question of whether emotion regulation is a significant moderator in the EW intervention.

**Emotion Regulation and Expressive Writing: Support for the Moderation Hypothesis**

It is important to review two related constructs studied within the EW literature that are thought to involve deficits in emotion regulation; specifically, the moderating effects of alexithymia and limited emotional intelligence on EW outcome will be examined. Lumley and colleagues (2002) posit that alexithymic individuals attempting to engage in the EW intervention “may be confused, perhaps be unable to identify a stressor, have trouble differentiating and labeling negative emotions or positive emotions, and demonstrate little insight into their experiences. In theory, these deficits should hinder the emotional as well as cognitive work needed to benefit from disclosure” (p. 84). A number of studies exist that suggest that this is indeed the case (Kelley, Lumley, & Leison, 1997; Kraft et al., 2003, as cited in Lumley, 2004; Norman et al., 2004; O’Conner & Ashley, 2008).

For instance, O’Conner and Ashley (2008) have recently demonstrated that alexithymia moderated the impact of writing condition on a measure of psychological distress at 2-week
follow-up. Specifically, in comparison to the control writing group, EW participants with lower baseline scores on alexithymia reported significantly lower levels of emotional distress at a 2-week follow-up assessment in comparison to high level alexithymics. Similar results have been found for physical health outcomes as well (Kelley et al., 1997; Norman et al., 2004).

However, research into the moderating effects of alexithymia has produced mixed results (Lumley, 2004; Lumley et al., 2002). For instance, some studies have failed to find any relationship between alexithymia and outcome in EW studies (van Middendorp & Geenen, 2008; Vedhara et al., 2010), while others have found a moderating effect suggesting that EW participants who are higher in alexithymia improved more (Baikie, 2008; Paez et al., 1999; Solano, Donati, Pecci, Persichetti, & Colaci, 2003).

In order to account for the inconsistent findings in the literature, Lumley (2004) has suggested several potential reasons to explain these differences. For instance, the studies that have demonstrated highly alexithymic individuals improve more from the EW intervention have used psychologically and physically healthy participants from a college population and have used control conditions that differed from the standard EW disclosure paradigm (with the exception of the more recent study conducted by van Middendorp & Geenen, 2008). Most importantly, these studies have found that it was only the difficulties describing feelings subscale of the TAS-20 (Bagby, Parker, et al., 1994; Bagby, Taylor, et al., 1994), a commonly used measure of alexithymia, which moderated the effects of the EW intervention.

In contrast to this, the studies that have demonstrated that people with high levels of alexithymia are not likely to benefit from the EW intervention have tended to recruit participants with chronic health problems and elevated levels of psychological distress and have utilized a neutral control writing condition in line with the standard EW paradigm. Furthermore, these
studies have consistently found significant moderating effects for the TAS-20 total score, as well as two of its subscales that measure difficulties identifying and differentiating feelings and externally-oriented thinking. Based on a review of this literature, Lumley (2004) concludes that “alexithymic people do not benefit from emotional disclosure” (p. 1290). Although these findings are mixed, and such a strong conclusion is not necessarily agreed with, the evidence reviewed offers some support for our moderation hypothesis.

Further support for our hypothesis comes from an EW study that examined whether perceived emotional intelligence (as defined by attempts to acknowledge, understand, and express emotions) moderated the improvements in a group of undergraduates suffering from migraines (Kraft et al., 2008). Participants were assigned to either an EW group, a relaxation condition, or a time-management control group. Results demonstrated that emotional intelligence moderated the effects of the EW group versus the control group on headache frequency and disability, as well as marginally on negative affect and severity of their pain (with those with greater levels of emotional skills demonstrating greater improvements). Additionally, emotional intelligence moderated the effects of the EW group versus the relaxation group on headache frequency and positive affect, with those with greater emotional skills reporting fewer headaches and more positive affect.

Given the overlap between the concepts of alexithymia and emotional intelligence with our definition of emotion regulation, these studies provide indirect support, albeit somewhat mixed at times, for our hypothesis that difficulties in emotion regulation will moderate the benefits that EW participants receive from writing emotionally about their traumatic experiences. More direct support for this comes from two studies that suggest that an individual’s pre-existing ability to regulate their emotions will impact and moderate the success that this intervention has
for them. Specifically, studies by Sloan and Epstein (2005), as well as O’Conner and colleagues (2005) have examined the moderating effect of respiratory sinus arrhythmia (RSA; a physiological indicator of emotion regulation ability) on EW outcome, and found some tentative, yet promising results.

According to Porges (1986, 1995, 1997), the polyvagal theory is a model of physiology and emotion regulation that suggests RSA is linked to a variety of self-regulatory processes. According to Sloan and Epstein (2005),

changes in RSA reflect the activity of the vagus nerve, and an increase in RSA is strongly positively correlated with increases in parasympathetic influence on the heart. RSA is measured by assessing how much heart period changes from beat to beat…and vagal responses to stress function as a ‘brake’ to rapidly regulate responses to environmental demands. (p. 611)

There is accumulating evidence that suggests that increased RSA is associated with better emotion regulation abilities.

For example, studies have found that higher levels of RSA were related to better social competency (Eisenberg et al., 1995) as well as more resilience when faced with a stressful situation (Fabes & Eisenberg, 1997). Furthermore, more appropriate fluctuation in RSA levels (i.e., being able to decrease fluctuations after a stressor) has been suggested to act as a buffer against the development of psychiatric disorders (El-Sheikh, 2001). Moreover, low RSA levels have been tied to a number of deficits in emotion regulation abilities, and have been predictive of poor treatment outcomes (Rottenberg, Clift, Bolden, & Salomon, 2007). For instance, low RSA has been tied to greater difficulties with anxiety (Cohen et al., 2000; Thayer, Friedman, & Borkovec, 1996), poor impulse control (Beauchaine, 2001), alexithymia personality types (Neumann, Sollers, Thayer, & Waldstein, 2004) and high levels of hostility (Sloan et al., 1994). The aforementioned studies and the polyvagal theory outlined by Porges (1986; 1995; 1997)
suggest that RSA is a valid index of emotion regulation abilities. Now it is time to look at two studies in the EW literature that attempted to examine whether RSA moderated the beneficial effects of the EW intervention.

The first study attempting to answer this question, using RSA as a marker of emotion regulation abilities, was conducted by O’Conner and colleagues (2005). The purpose of this study was two-fold. First, they set out to examine whether EW would be beneficial for a group of bereaved adults (N = 35). In line with previous research that has shown inconsistent findings with bereaved populations (Bower et al., 2003; Range et al., 2000; Stroebe et al., 2002), this particular study demonstrated that EW participants did not benefit any more than the control writing group. However, as a second aim to the study, O’Conner and colleagues expected that those bereaved adults (in the EW condition but not the control condition) with greater abilities to regulate their emotions (as measured by RSA) would show greater benefits than those with deficits in these abilities. Consistent with their hypothesis, the results of the study demonstrated that greater RSA during the first writing session (i.e., greater emotional regulation ability) was marginally predictive of lower depression scores (in the EW condition but not the control group), suggesting that it may be a potential moderator. Although these findings are small and tentative, a number of limitations exist within this particular study that may have attenuated the effects, including a small sample size of mostly women, a bereaved population, and a methodology that deviates from the standard instructions in terms of dosage and frequency of writing.

In order to examine whether the aforementioned limitations played a role in attenuating the results that O’Conner and colleagues reported, a subsequent study was conducted by Sloan and Epstein (2005). These two researchers conducted a well-controlled EW study that involved the use of two groups: an EW condition and a control writing condition. During the first session,
RSA was measured in all participants as a measure of their emotion regulation abilities. The results of this study demonstrated that greater RSA during the first writing session (i.e., greater emotional regulation ability) was predictive of lower depression scores and less physical complaints at follow up for the EW group but not the control group. Because this study used a sample that is more commonly used within EW studies, and due to the consistency with which Sloan and her research team have demonstrated significant findings in their EW studies, this particular study offers stronger support for the idea that emotion regulation is a moderator in the EW intervention.

To extend these findings, the current study investigated whether or not those with higher levels of self-reported emotion regulation abilities (as measured by the DERS total and DERS subscale scores) benefitted more from the EW intervention. Based on the findings reviewed thus far, it was expected that those EW participants (but not control participants) demonstrating higher levels of emotion regulation abilities at baseline would benefit more from the EW intervention. The difference between the current study and the two previous studies which used RSA as an indicator of emotion regulation is that our study attempted to examine this question using a self-report measure of emotion regulation abilities.

The rationale for conducting our study with the DERS is that it taps many facets of emotion regulation that exceed that of a single physiological measure of overarousal like RSA. When thinking of this in terms of the model of emotion regulation described earlier in this paper, studies that have examined RSA have only tapped one area of emotion regulation (i.e., modulation of arousal). As has already been delineated, there are a number of other areas of emotion regulation that are important to take into account (e.g., awareness of affect; an ability to
label, symbolize, and accept their experience; a modulation of behavior and emotional expression, and an ability to reflect on their experiencing and increase clarity).

The use of the DERS allows for these domains to be taken into account because it measures six distinct, yet related factors that have been statistically developed, and that map onto the stage model of emotional expression and the model of emotion regulation articulated by Watson and her colleagues. This allows us to potentially provide further evidence that emotion regulation abilities act as a moderator for participants in the EW intervention. Additionally, due to the variety of deficits measured by the DERS, the current study will allow us to gain a better understanding of which, if any, of the specific deficits in emotion regulation act as moderators.

**Emotion Regulation as a Mechanism of Action for Expressive Writing: Support for the Mediation Hypothesis**

A number of theorists and researchers have suggested that EW results in psychological and physical health benefits because it leads to improvements in emotion regulation abilities (Byrne-Davis et al., 2006; Kennedy-Moore & Watson, 1999; King, 2001, 2002; Smyth, Nazarian, et al., 2008). This argument is consistent with the work by emotion focused therapists who suggest that improvements in therapy result from being able to access, symbolize, differentiate, accept, and use emotions to facilitate successful coping and adaptive behavior by informing us of our needs, wants, and desires; being able to modulate our emotional arousal, emotional expression, and subsequent behaviours; and by being able to reflect on our emotional experience, integrate it with the cognitive/rational system, and successfully process our emotions (Elliot et al., 2004; Greenberg, 2002, 2004; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999).
In addition to experiential therapists who espouse the importance of increasing emotion regulation abilities, other theories proposed in the EW and psychotherapy literature also highlight the importance of being able to tolerate and regulate emotional arousal in the EW intervention. More specifically, related to the disinhibition theory which was initially posited by Pennebaker and his colleagues (Pennebaker, 1989, 1997; Pennebaker & Beall, 1986), Scheff (1979) discusses how the healing associated with a cathartic emotional discharge is not simply an immersion in emotional distress. Rather, Scheff posits that improvements may result from being able to achieve an optimum distance from the distressing emotions expressed. It is possible that this optimum distance within the EW procedure allows a person to gain perceptions of control and mastery over their emotional experience in a safe environment because being able to determine what they write about allows them to regulate how in touch they are with their emotional experience. Similarly, in terms of habituation theory (Bootzin, 1997; Kloss & Lisman, 2002; Sloan & Marx, 2004a; Sloan et al., 2005), Foa and her colleagues (Foa & Kozak, 1986; Hembree et al., 2003) discuss how habituation involves individuals gathering information through exposure to anxiety eliciting stimuli, thoughts, and emotions, which changes or replaces maladaptive fear structures with new competing fear structures. It is quite possible that through the EW intervention, there is a cognitive shift in what it means to experience negative emotions, and the person begins to recognize the time-limited and controllable nature of their emotions.

Greenberg, Wortman, and Stone (1996) have suggested that the benefits of EW may go beyond ones revision of past traumatic events, the cathartic release of previously inhibited emotions, or the mere exposure to personally relevant anxiety producing stimuli or memories, and may instead involve an enhancement of a person’s emotion regulation abilities. In order to provide support for this claim, Greenberg and colleagues (1996) conducted an EW study with the
purpose of examining whether writing about an imaginary trauma (i.e., somebody else’s trauma) would lead to physical and psychological health benefits. In doing so, participants were assigned to one of three writing conditions: an EW real trauma condition, an EW imaginary trauma condition, and a control condition. The results of this study demonstrated that writing about real traumas as well as imagined traumas produced significant benefits over that of the control writing group. These findings are important as they suggest that it is not necessary to write about a personal traumatic event in order to experience benefits. The authors suggest instead that writing about any topic that triggers negative emotions that need to be regulated may be beneficial. They infer that the improvements in the imaginary trauma group were the result of improvements in emotion regulation abilities, as shown in more negative mood reported originally and then less so at follow-up. According to Greenberg and colleagues (1996), the EW intervention may enhance emotion regulation abilities by allowing participants to improve their skills and strategies associated with emotional awareness, tolerance, and modulation; develop perceptions of increased control and self efficacy in response to emotional arousal; and develop self-empathy and acceptance of their emotional experience and reactions.

Further support for our mediation hypothesis comes from research demonstrating that EW instructions that encourage emotional or self regulation result in better outcomes. For instance, Cameron and Nicholls (1998) attempted to examine the EW intervention with a group of participants adjusting to college. Participants in this study were assigned to one of three writing conditions: the EW condition, the self-regulation writing condition, and the control writing condition. The self-regulation condition instructions were standard EW instructions, with an additional piece that was meant to facilitate participants’ ability to integrate their beliefs, emotions, and experiences so they could better make sense of their problems and learn to cope
with them more adaptively. The results of this study demonstrated that the self-regulation and EW conditions resulted in improvements that were significantly higher than those of the control writing group. Moreover, being assigned to the self-regulation writing group was associated with greater improvements over and above those seen in the EW group.

King and Miner (2000) have provided further support for the mediation hypothesis by examining the effects of writing positively about a traumatic experience, which they posited would result in psychological and physical health benefits because it would enhance emotion regulation abilities. King and Miner assigned participants to one of four writing conditions: a trauma condition, a trauma plus perceived benefits condition, a perceived benefits only condition, and a control writing condition. The perceived benefits writing instructions requested that participants write about what they felt were the positive aspects of the traumatic event, how they believed they had grown or benefited as a result of the experience, and also if they felt they were better able to deal with future challenges. The results of this study demonstrated that the trauma writing group, the perceived benefits only writing condition, and the trauma plus perceived benefits condition had fewer health centre visits than the control group at 3-month follow-up; however, this effect remained only for the trauma condition and perceived benefits only condition at 6-month follow-up. A text analysis of the writing demonstrated that the writings produced by the participants in this study differed, with the perceived benefits writing group using more positive and insight related words than the other groups, and the trauma group having writing samples rated as more traumatic, less positive, more negative, and less resolved. The authors concluded that writing positively may have enhanced self-regulation abilities in the participants because it taught them adaptive coping skills, such as shifting attention from their distress to more positive aspects and emotions; it allowed for a more positive reappraisal of the
traumatic event; it provided participants with an opportunity to find new meaning in their traumatic experience; and because it facilitated a greater understanding of their emotional experience and a greater sense of control over their emotions.

King (2001) also attempted to examine if writing about non-emotional topics, with instructions aimed at enhancing emotion regulation abilities, would result in improvements in physical and psychological health. In order to test this hypothesis, King assigned participants to one of four writing conditions: a best possible future self/goals condition, an EW condition, an EW and best possible future self/goals condition, and a control writing condition. The results indicated that at the 3-week follow-up period, the best possible future self/goals condition was associated with higher ratings on happiness and feeling less upset. Additionally, at the 5-month follow-up, the two groups involving the best possible self demonstrated greater gains in psychological well-being. Furthermore, the best possible self condition and trauma only condition were both associated with lower medical illness visits than the control at 5-month follow-up. As can be seen from these findings, the improvements observed in the best possible future self/goals were equal to or better than the trauma condition, and most importantly, did not result in the initial decrements in mood that is often seen in studies where participants write about traumatic events. The authors argued that striving towards their goals and gaining insight into their needs helped participants to regulate their emotions and led to them feeling more control over their emotional experience and their ability to achieve their goals.

The aforementioned studies have provided some tentative links between the EW intervention and the enhancement of a person’s ability to regulate their emotions and behaviour. However, although the authors of the previous studies assume that emotion regulation abilities increased, none of the studies actually measured these abilities. More recent work in the EW
literature has addressed this limitation. For instance, Smyth, Hockemeyer, and colleagues (2008) demonstrated that in comparison to control writing participants, EW participants showed less of a stress response, and greater recovery from this response (as measured by cortisol reactivity) after being exposed to their traumatic memory at follow-up. These same EW participants also demonstrated greater improvements on measures of dysphoric mood in comparison to the control group; however, no mediation analyses were performed in this study to examine the mediating relationship between cortisol response changes and improvements on outcome measures.

The results of two studies conducted by Lutgendorf and her colleagues (Lutgendorf & Antoni, 1999; Lutgendorf, Antoni, Kumar, & Schneiderman, 1994) have examined the predicting (but not necessarily mediating) effects of depth of emotional processing/experiencing within a verbal emotional disclosure procedure similar to EW. In both of these studies, participants were assigned to verbally disclose on three occasions for 20-minutes about a distressing event while being videotaped, and a process measure assessing experiential involvement was applied. Low scores on the Experiencing Scale (EXP; Klein, Mathieu, Gendlin, & Kiesler, 1969) indicate emotional distance from the traumatic events being described, while high scores suggest intense cognitive and emotional involvement and attempts to actively engage and reconceptualize issues related to the traumatic event in a new way. Lutgendorf and her colleagues demonstrated that higher levels of emotional engagement led to improvements to antibody titres to the Epstein-Barr virus viral capsid antigen (Lutgendorf et al., 1994). Moreover, they demonstrated that depth of experiencing increased from session one to session three; higher levels of overall experiencing predicted higher levels of insight at session three; and a combination of higher negative mood arousal and higher levels of experiencing led to greater negative mood reductions at follow-up (Lutgendorf & Antoni, 1999).
Similarly, recent research has extended the findings by Lutgendorf and her colleagues and utilized the Experiencing Scale within the EW literature. Specifically, Pachankis and Goldfried (2010) demonstrated that participants who were assigned to an EW group and asked to write emotionally about gay related distress reported significantly greater openness with their sexual orientation at 3-month follow-up in comparison to a neutral control writing group. Moreover, they reported that higher levels of emotional engagement (as measured by higher modal experiencing scores) was significantly predictive of higher levels of negative affect at post-test (i.e., the day after writing), and marginally related to lower gay-related rejection sensitivity at 3-month follow-up. Interestingly, and counter to their hypothesis, Pachankis and Goldfried found that higher levels of emotional engagement was significantly predictive of more discomfort about being gay at 3-month follow-up.

Although the aforementioned studies have demonstrated a significant relationship between improvements/changes in emotion regulation abilities, none of them have actually tested a mediation hypothesis, and thus, offer only limited support for our predictions. Low, Stanton, and Danoff-Burg (2006) have recently addressed this limitation as they attempted to examine whether participants’ increased ability to regulate stress related physiological, affective, and cognitive experiences mediated the improvements seen in EW studies. Although they were unable to find a mediating relationship between affective regulation (as measured by increased positive emotion words and decreased negative emotion words) and cognitive regulation (as measured by increases in insight and causal related words), Low and her colleagues did demonstrate that within-session physiological habituation (as measured by changes in heart rate throughout the 20-minute writing sessions) mediated outcome. Specifically, in a group assigned to write emotionally about their experience of being diagnosed with cancer, participants with
greater within-session heart rate habituation demonstrated greater improvements in self-reported physical symptoms. The authors concluded that the “prolonged and repeated exposure and concomitant processing might contribute to improved regulation of physiological responses, presumably leading to less stress on bodily systems and ultimately, enhanced physical health” (p. 187).

Similarly, recent research examining the mediating influence of brooding and reflection on changes in depression scores for EW participants has provided further support for our hypothesis. Specifically, Gortner, Rude, and Pennebaker (2006) hypothesized that reductions in brooding (as defined as changes in unproductive self-judgment of emotional experience from pre to post writing), but not reflection (as defined as changes in attention to distress from pre to post writing), would mediate the improvements on depression scores in EW participants. Results of mediational analyses supported their hypotheses, suggesting that greater reductions in self-judgments (i.e., increased acceptance of their emotional experience) led to more successful emotional processing and greater improvements on depression scores. Although they failed to demonstrate that reflection on emotion experience mediated improvements on depression scores in EW participants, these results provide partial support for our mediation hypothesis.

As can be seen from a review of the relevant literature, some studies provide support for the mediating role of emotion regulation. However, the evidence is still premature and no firm conclusions can be made. Moreover, limitations exist making it difficult to decipher whether: a) participating in the EW intervention actually facilitates increases in emotion regulation abilities and b) whether these enhancements in emotion regulation abilities are mediating the benefits participants receive from the EW intervention. As a result of these limitations, one of the aims of the current study was to investigate whether there were increases in participants’ self-reported
abilities to regulate their emotions after taking part in the EW intervention, and whether these increases were related to benefits on psychological and physical health outcomes measures (for the EW group but not the control group). Using the DERS allows for an examination of the mediating role of various domains of emotion regulation abilities, thus, potentially adding to the existing literature in support of this hypothesis.

**Hypotheses for the Current Study**

1. Those participants in the EW condition will demonstrate significantly greater improvements from baseline to follow-up on psychological (i.e., BDI-II and PDS total scores) and physical (i.e., PILL total score) health outcome measures, as well as in their abilities to regulate their emotions (i.e., DERS total score and DERS subscales), in comparison to those in the control condition.

2. Baseline scores on the DERS (as well as the DERS subscales) will be a moderator of the effect of group membership in improvements on outcome measures (i.e., those in the EW group, but not the control, with greater abilities to regulate their emotions, will demonstrate greater improvements on psychological and physical health outcome measures).

3. Greater gains in emotion regulation abilities for EW participants, but not for control participants, will be significantly related to greater improvements in psychological and physical health outcome measures (i.e., the DERS total score and subscales will act as a mediator in terms of benefits on outcome measures for the EW group but not for the control group).
Chapter 2:
Method

Participants

Seventy-five participants were recruited from the community and were asked to participate in the study. In order to be included in this study, participants were required to meet the following eligibility criteria:

1. identify as having experienced a past traumatic event (excluding bereavement);
2. be currently experiencing distress as a result of this event;
3. be fluent in English;
4. report no use of a personal diary for the past 12 months;
5. not currently be involved in psychotherapy or on any psychotropic medications.

As well, individuals who were deemed at risk or indicated an urgent need for assistance were excluded from the study and given an appropriate referral; although at no time did this action have to be taken.

Demographic information is displayed in Tables 1, 2, and 3. Ages of participants ranged from 18 to 62, with a mean age of 30.52 years and a standard deviation of 11.37 years. Of the total sample, 30% were male \((n = 18)\) and 70% were female \((n = 42)\). The majority of the sample identified themselves as Caucasian/European \((n = 28, 46.67\%)\). With regards to marital status, most of the participants were single \((n = 52, 86.7\%)\). Twenty-eight \((46.7\%)\) participants had graduated high school or completed at least some high school, while 32 \((53.3\%)\) participants had graduated either college or university.
Participants varied in regards to how much they had previously shared their traumatic experiences with others, with 9 participants (15%) having never disclosed before, 31 participants (51.6%) disclosing a little, 14 participants (23.3%) disclosing a moderate amount, and 6 participants (10%) disclosing a lot. As can be seen in Table 4, the most frequently reported traumatic event involved being in an accident ($n = 15, 25\%$). Similar to other EW studies (Sloan et al., 2005), over 73% of the participants in the current sample endorsed experiencing multiple traumatic events in their lives.

Participants were also asked about previous psychotherapy experience and whether they had ever taken psychotropic medications (see Table 3). Seventeen participants (28.3%) reported having been involved in psychotherapy at some point in their lives, while six participants (10%) reported having taken psychotropic medications in the past.

Measures

Psychological and physical outcome measures.

Posttraumatic stress diagnostic scale (PDS; Foa, 1995). The PDS is a 49-item self-report measure of PTSD related symptoms that participants endorse experiencing over the past month. The PDS items were designed to correspond to the DSM-IV diagnostic criteria (APA, 1994). For instance, items inquire about re-experiencing symptoms (e.g., “Having bad dreams or nightmares about the traumatic event”); avoidance and numbing symptoms (e.g., “Trying to avoid activities, people, or places that remind you of the traumatic event”, “Having much less interest or participating much less often in important activities”); as well as increased arousal symptoms (e.g., “Having trouble falling or staying asleep”). Participants rate if they have experienced a particular symptom (yes or no), and the frequency of that symptom on a scale
from 0 (“Not at all or only one time”) to 3 (“5 or more times a week/almost always”). Symptom severity scores range from 0-51 and are as follows: below 10 is mild; scores between 10-20 are considered moderate; scores between 21-35 are considered moderate to severe; and scores above 35 are regarded as severe. Research outlined in the PDS manual has demonstrated that the PDS symptom severity scale has good psychometric properties with high test-retest reliability (.83) after approximately two weeks, high internal consistency (.92), and high convergent validity with other measures of anxiety (.79) and depression (.80). The PDS was administered at baseline as well as at follow-up and similar to previous EW studies the overall symptom severity score was used to measure changes in PTSD symptomatology.

*Beck depression inventory, second version (BDI-II; Beck, Steer, & Brown, 1996).* The BDI-II is a 21-item self-report measure of current depression related symptoms. It measures symptoms related to the cognitive, affective, motivational, and physiological aspects of depression. The BDI-II items were designed to correspond to the DSM-IV-TR diagnostic criteria (APA, 2000). Each item consists of four statements that reflect severity level, and each participant is asked to select a statement that best reflects their recent symptoms from the past 2 weeks. For instance, the sadness item provides four response options: 0 = “I do not feel sad”; 1 = “I feel sad much of the time”; 2 = “I am sad all of the time”; 3 = “I am so sad or unhappy that I can’t stand it”. Similarly, the worthlessness item provides the following response options: 0 = “I do not feel I am worthless”; 1 = “I don’t consider myself as worthwhile and useful as I used to”; 2 = “I feel more worthless as compared to other people”; and 3 = “I feel utterly worthless”. Symptom severity scores range from 0-63 and are as follows: scores between 0-13 reflect minimal symptoms of depression; 14-19 indicate mild depressive symptomatology; 20-28 suggest moderate symptoms of depression; and scores between 29-63 suggest severe symptoms.
Many studies have used this particular measure and the manual outlines how it has good to excellent psychometric properties in terms of test-retest reliability (.93) after 1 week, internal consistency (.92 - .93), and convergent and divergent validity (Beck et al., 1996). The BDI-II was administered at baseline as well as follow-up to measure changes in depressive symptomatology.

**Pennebaker inventory of limbic languidness (PILL; Pennebaker, 1982).** The PILL is a 54-item self-report measure of common physical symptoms and sensations. Participants are asked how frequently they have experienced a particular symptom (e.g., lump in throat, racing heart, upset stomach, back pains, skin breaks out in a rash, headaches, sore throat). Their response options include: A = “Have never or almost never experienced the symptoms”, B = “Less than 3 or 4 times per year”, C = “Every month or so”, D = “Every week or so”, D = “More than once every week”. The PILL is scored by summing up the total number of items that are endorsed to have occurred at least once a month (i.e., C or higher). Scores range from 0-54 and according to data collected on a college sample by Pennebaker (1982), the mean score of the PILL is 17.9 (SD = 4.5). Although no clinical cut offs exist, EW studies that have demonstrated significant improvements on the PILL have had participants endorsing PILL scores ranging from 21.1 (SD = 8.6) for EW participants and 22.7 (SD = 9.3) for control participants (Sloan & Marx, 2004a), with others scores ranging from 23.1 (SD = 8.6) for EW participants and 21.6 (SD = 8.1) for control participants (Sloan et al., 2007). Research has demonstrated that 2-month test-retest reliability ranges from .79-.83, and internal consistency ranges from .88-.91. Additionally, higher scores on the PILL are significantly related to a greater number of sick days and health centre visits (Pennebaker, 1982). The PILL was administered at baseline as well as follow-up to measure changes in physical health symptomatology.
Difficulties in emotion regulation scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item self-report questionnaire that measures a variety of clinically relevant difficulties in emotion regulation that are frequently seen in clinical settings and that are reported in the literature. It asks participants to indicate how often each item applies to themselves, with response options ranging from almost never (response choice = 1) to almost always (response choice = 5). The DERS has been shown to be comprised of six distinct, yet related factors of emotion regulation difficulties: (1) Lack of emotional awareness (e.g., “I am attentive to my feelings” – reversed scored); (2) Lack of emotional clarity (e.g., “I have difficulty making sense out of my feelings”); (3) Nonacceptance of emotional responses (“When I’m upset, I become embarrassed for feeling that way”); (4) Difficulties engaging in goal directed behaviour when distressed (e.g., When I’m upset, I have difficulties focusing on other things”); (5) Impulse control difficulties (e.g., “I experience my emotions as overwhelming and out of control”); and (6) Limited access to emotion regulation strategies (e.g., “When I’m upset, I believe that there is nothing I can do to make myself feel better”). Scores range from 36-180 on the DERS, and according to a review of the literature by Gratz and Tull (2010), nonclinical community and college student samples average 75-80 on the DERS; college students engaging in self-harming behaviours average 85-90; substance users seeking treatment average 85-90; individuals dealing with panic symptoms average 89-95; samples with generalized anxiety disorder symptoms average 95-100; individuals with symptoms at a severity level consistent with a diagnosis if PTSD average 100-105; and outpatient borderline personality disorder samples average 125 on the DERS (see Gratz & Tull, 2010, for a review). Although the DERS is a relatively young scale, the authors report excellent overall internal consistency (.93) for the DERS total score as well good internal consistency for each subscale (.80 - .89). Additionally, in a sample of college
students, test-retest reliability for the overall score over a span of 4 to 8 weeks was found to be good (.80), with modest to good reliabilities for each subscale (.57-.89). According to the authors, there is evidence in support of the measures construct validity. Specifically, they have demonstrated that the overall DERS score and each of the subscales were significantly positively correlated with a measure of experiential avoidance (The Acceptance and Action Questionnaire; Hayes et al., 2004) and a questionnaire that measures participants’ expectancies that their attempts to regulate negative moods will be successful (General Expectancy for Negative Mood Regulation; Catanzaro & Mearns, 1990). Finally, the DERS has been used in a number of published research studies by Gratz and colleagues (Gratz, 2007; Gratz & Gunderson, 2006; Gratz, Lacroce, & Gunderson, 2006) up to this point. These studies have demonstrated significant drops at post treatment in DERS scores after taking part in psychological interventions. The DERS was administered at baseline as well as follow-up to measure changes in overall emotion regulation abilities and the respective subscale changes. The total scores as well as the respective subscale scores were also used to test our moderation and mediation hypotheses.

Other measures.

**Demographic questionnaire.** A number of demographic information variables were collected during the baseline measure session (see Appendix A). These include: age, gender, marital status, education, ethnicity, previous treatment/medication use, and the amount of previous disclosure about their traumatic experience.

**Manipulation check questionnaire.** This measure was administered at the 1-month follow-up. On 7-point rating scales ranging from “not at all” to “a great deal”, participants
answered six questions pertaining to the extent to which their writing was personal, emotional, difficult to do, disclosing, beneficial, and valuable to them (see Appendix B). Only one question was analyzed for the current study. Specifically, on a 7-point rating scale ranging from “not at all” to “a great deal”, participants answered a question pertaining to the extent to which their writing was emotional. This particular question was asked of participants in each group to ensure that the writing conditions differed from each other in terms of emotionality of the writing.

**Self-assessment manikin (SAM; Bradley & Lang, 1994).** The SAM is a measure used to obtain subjective ratings of valence (pleasantness), arousal, and dominance. This measure was given to participants after each writing session but only the arousal dimension was analyzed for the purposes of the study. The SAM uses manikin figures on a 9-point scale for each of the affective dimensions. On the arousal dimension, the SAM ranges from a very excited figure that has eyes wide open and an active body posture (1 = very aroused) to a calm figure with eyes closed and a very still body posture (9 = very calm). Research has demonstrated that the SAM statistically significantly covaries with physiological reactions associated with emotional experience (e.g., skin conductance and heart rate), and is therefore a valid measure of emotional responding (Bradley, Greenwald, Petry, & Lang, 1992; Lang, Greenwald, Bradley, & Hamm, 1993). It was administered immediately after each writing session, by asking participants to mark the point along the respective scales that best represent their responses to writing. The SAM 1 arousal scores were used in the manipulation check analyses to ensure that the EW group was writing more emotionally in comparison to the control group. An arousal change score was also computed to test the moderation and mediation hypotheses.
**Open-ended question.** For exploratory purposes, an open ended question was included at the end of the study (see Appendix C). This allowed participants to indicate why they thought the writing was or was not helpful in dealing with their trauma.

**Procedure**

**Recruitment of participants.** The overwhelming majority of participants for this study were recruited through advertisements placed online. Specifically, contact information, select study details, and the inclusion criteria were posted on free websites that use a classifieds style of advertising, such as Craigslist and Kijiji (see Appendix D). Individuals who browse these websites and who came across the advertisement were encouraged to call our office if they were interested in participating or to pass the information along to others who might be eligible. Further, a group was created on the online social networking site Facebook in order to generate interest and disseminate information about the study. Individuals with Facebook accounts who came across the group (either by chance or invitation) were presented with the same information as the online classified advertisements, with the added option of “joining” the group and inviting friends. It was made explicitly clear that joining the group was not necessary, and that the purpose of doing so would be solely for passing along the information. At its height, the group reached a total of 190 members. In addition to the online advertising, posters were put up in various public locations around the University of Toronto campus (see Appendix E).

**Screening of participants.** Interested individuals who called in were given a brief explanation of what the study would entail. Prior to asking any questions pertaining to the eligibility criteria, individuals were informed that their answers to these questions would be used to determine whether they could be included in the study. When consent to continue was given, potential participants were screened using the inclusion criteria. Specifically, participants were
screened to ensure: they could speak, write, and read English fluently; they had not used a diary within the past 12 months; they had experienced a past event that they considered traumatic (excluding bereavement); the traumatic event continued to cause them distress; they were not currently engaged in psychotherapy or taken psychotropic medication; and they were not an imminent threat to themselves or someone else. In order to determine current distress, individuals were asked an open-ended question about whether they were experiencing distress. If the scope of the distress was not evident initially based on the individuals response, the experimenter provided examples of various re-experiencing, avoidance, numbing, and increased arousal symptoms to determine whether individuals were experiencing related symptomatology. No cutoff was used and any participant endorsing current distress was accepted into the study. Those participants who were deemed ineligible were given specific information in regards to why their particular answers made them ineligible. A comprehensive list of emergency contact resources was also offered (see Appendix F). Additionally, on a few occasions, participants who requested further information about EW were directed to James Pennebaker’s website. Individuals who did meet the eligibility criteria were provided with further details of the study and scheduled to come into the offices on three consecutive days. Once booked, participants were assigned the next available identification number; participants assigned to odd numbers were placed into the EW group, and those assigned to even numbers were placed into the control group. This was done to ensure random assignment to each group.

**First session.** Participants arriving for their first sessions were told to meet the experimenter in the lobby of the university building. Participants were then brought to one of two private testing rooms. Both rooms were made to look exactly alike, with each containing two chairs, one desk, a box of tissues and a container holding pens, pencils and an eraser. Upon
arriving in the testing room, the experimenter provided participants with a consent form (see Appendix G), explained the main issues related to the study, and offered to answer any questions or address any concerns. Once the consent form was signed, participants were instructed to work through the questionnaire package in the order it was in, and they were left alone in the room to do so. When the questionnaires were complete (approximately forty minutes later), participants were instructed to place them into a confidential envelope. They were then provided with their first writing task (either EW or control) as well as a blank booklet to write in. The experimenter informed participants that there would be a knock on the door 20 minutes later and that this was the signal to stop writing.

Once participants began the writing session, the experimenter would bring the questionnaire package to a research assistant, who did not know the name or any other information about the individual being tested. It was the responsibility of the research assistant to check for suicide risk as indicated by the BDI-II. Protocol dictated that participants scoring either a two (indicating “I would like to kill myself”) or a three (indicating “I would kill myself if I had the chance”) on question number nine were considered to be at risk. In these cases, one of the principal investigators was to intervene in the study, pay the participant for the current session, and work together with him or her to figure out the most appropriate next steps (e.g., community referral, having a discussion with Dr. Jeanne Watson, contacting the authorities). Fortunately, there were no participants who were deemed to be at risk, so this course of action was never taken.

Once the 20 minutes expired, the experimenter would enter the room and ask participants to place their writing into an envelope. The experimenter would once again bring the materials to the research assistant so the writing could be screened for risk. Essays were checked for content
relating to suicidal or homicidal intent, and research assistants were instructed to inform one of the principle investigators if there was any writing that suggested even the slightest possibility of risk. If there were reason to believe that a participant may be a risk to himself/herself or to someone else, the same protocol would be followed as outlined in regards to risk on the BDI-II. As with the BDI-II, no risk was ever identified and this course of action was never taken. Before ending the session, participants were compensated with $10.00, were given the list of emergency contact resources, and were reminded of their sessions on the following days.

**Second and third sessions.** On the second and third days of the experiment, participants again met the experimenter in the university lobby and were brought into one of the private testing rooms. They were then given the next set of writing instructions that corresponded to their group as well as a blank writing booklet. Writing procedures then followed those outlined for session one. At the end of the third session, participants were booked for their 1-month follow-up session and were informed that they would receive a reminder call approximately a week before the follow-up session was to take place.

**Follow-up session.** The fourth and final session took place an average one month following the third session, with a range between 26 and 50 days, with the majority of participants participating in the follow-up exactly 28 days later. In this session, participants were asked to work through the package of follow-up questionnaires in the order provided (approximately thirty minutes). When the questionnaires were complete, the experimenter would provide participants with a debriefing form (see Appendix H); while this was being read, the experimenter would once again bring the materials to a research assistant so that the BDI-II could be checked for risk. When no risk was discovered, as was always the case, the experimenter would fully debrief the participant. This involved providing information about the
purpose of the study, the different writing conditions, and the main hypotheses of the study. A copy of all writing instructions for both groups was also offered, along with another copy of the emergency contact list. Participants were then given as much time as they desired to ask questions about the study. For those who were interested, email addresses were collected for the purpose of sending the results of the study once all analyses were complete. Before ending the session, participants were compensated the final $10.00 and were informed that, for finishing the study, they would be entered into a draw to win a $100.00 cash prize.

**Writing conditions.** The writing instructions used closely resemble those outlined by Sloan and her colleagues (Sloan et al., 2007; Sloan & Marx, 2004a; see Appendix I). For the control condition, participants were asked to write on three consecutive days about how they use their time. Each set of instructions stressed that the writing was to be as objective and factual as possible, with no reference to their opinions or emotions. Specifically, on the first day participants were instructed to write about what they did the day before, from the moment they woke up to the moment they went to bed. On the second day they were instructed to write about what they had done on the present day since waking up. Lastly, on the third day they were asked to write about what they will be doing over the coming week.

For the EW condition, participants were asked to write on three consecutive days about the most traumatic event that they have ever experienced. In their writing, they were instructed to explore their deepest emotions and thoughts related to the experience. On the first day participants were encouraged to write about the event itself and how it may have affected them in various ways. On the second day they were instructed to continue writing about the same traumatic event, exploring their deepest thoughts and emotions. On the third day participants
were instructed to continue writing about the same traumatic event, with a focus on how it continues to affect them currently.

**Overview of Statistical Analyses**

**Manipulation check.** In order to ensure that the groups differed in terms of the emotionality versus neutrality of the writing, two separate independent samples *t*-tests were performed using group (EW versus control) as the independent variable and emotionality of the writing (from the manipulation check questionnaire) and arousal (from the Time 1 SAM) as the dependent variables.

**Description of sample.** In order to ensure that no differences on baseline outcome measures exist between completers and dropouts, multiple independent samples *t*-tests were conducted. Descriptive statistics were then conducted on all demographic variables. In order to ensure that the groups did not differ at the outset of the study on a number of demographic variables, a series of *chi-square* analyses were conducted on gender, ethnicity, marital status, and level of education. In order to ensure that the groups did not differ at the outset of the study in age, an independent samples *t*-test was performed using group (EW versus control) as the independent variable and age as the dependent variable. *Chi-square tests* were conducted in order to ensure that no differences between groups existed in the amount that a participant had shared their traumatic experience with others, whether they had previously engaged in psychotherapy, or whether they had previously taken medication.

The minimum, maximum, mean, standard deviation, skewness and kurtosis for all outcome measures (BDI-II, PDS, PILL, DERS Total and DERS subscales) at Time 1 and Time 2 for the entire sample were generated. All outcome measures with the exception of the Pre PDS,
Pre DERS Non-Acceptance, Pre DERS Goals, Post DERS Goals, Pre DERS Awareness, and Post DERS Awareness were found to be in violation of assumptions of normality as a result of being positively skewed. Accordingly, the square root transformation (Sqrt) was applied in order to correct the distributions. All analyses involving these measures used the transformed values. The mean and standard deviation for all outcome measures (BDI-II, PDS, PILL, DERS, and DERS subscales) were also generated by group.

**Relationships between outcome variables.** To examine the relationship between difficulties in emotion regulation and the outcome measures, and between the outcome measures themselves, Pearson correlations were computed for DERS Total Score, as well as the BDI-II, PDS, and PILL at Time 1 and Time 2. To examine the relationship between the subscales of the DERS, Pearson correlations were computed for each subscale at Time 1 and Time 2.

**Comparison of baseline scores on outcome measures between groups.** In order to ensure that groups did not differ on any of the outcome measures at baseline, a series of independent samples t-tests were performed using group (EW versus control) as the independent variable and all other measures (i.e., Pre BDI-II, Pre PDS, Pre PILL, Pre DERS, and Pre DERS subscales) as the dependent variables.

**Testing the effects of treatment as well as emotion regulation as a moderator.** In order to test the first two hypotheses, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of Pre Scores (i.e., Pre BDI-II, Pre PDS, and Pre PILL), Group, Pre DERS, and the interaction of Pre DERS by Group significantly predicted scores on Post scores (i.e., Post BDI-II, Post PDS, and Post PILL). After running these analyses with the Pre DERS total score entered, Pre DERS total was substituted in turn with each of the six Pre DERS subscales.
If the results demonstrated a significant interaction, suggesting that Pre DERS scores (including subscale scores) differentially predicted outcome for the EW and control group, further analyses were conducted. Specifically, the simple slopes of significant two-way interactions were investigated following the guidelines described by O’Conner (1998) and the necessary variables were entered into a program developed by him (see https://people.ok.ubc.ca/brioconn/simple/simple.html).

Additionally, in order to test our first hypothesis for the DERS total score and each of the six DERS subscales, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of the Pre DERS total score (or subscale score), and Group significantly predicted scores on Post DERS total score (or its respective subscale score).

**Testing the effects of emotion regulation as a mediator.** In order to investigate the mediation hypothesis, a mediation analysis following the approach outlined by Baron and Kenny (1986) was conducted. Given the hypothesis for the current study predicted that mediation would exist for the EW group but not the control group, these analyses were conducted separately for each group. In order for a mediation to take place, a number of multiple regressions were conducted to determine if the following conditions were met:

1. The predictor variable X (i.e., baseline outcome measure) was significantly correlated with the criterion variable Y (i.e., follow-up outcome measure).

2. The predictor variable X (i.e., baseline outcome measure) was significantly correlated with the mediating variable M (i.e., emotion regulation change score).
3. The mediating variable M (i.e., emotion regulation change score) was significantly correlated with the criterion variable Y (i.e., follow-up outcome measure) when controlling for the predictor variable X (i.e., baseline outcome measure).

4. For a full mediation to exist, the effect of the predictor variable X (i.e., baseline outcome measure) on the criterion variable Y (i.e., follow-up outcome measure), controlling for the mediating variable M (i.e., emotion regulation change score), should be 0. If a partial mediation exists, the Sobel test would be performed via the use of an online calculator to determine significance (http://people.ku.edu/~preacher/sobel/sobel.htm).
Manipulation Check

In order to ensure that the groups differed in terms of the emotionality versus neutrality of the writing, two independent samples $t$-tests were performed using group (EW versus control) as the independent variable and emotionality of the writing (from the manipulation check questionnaire) and arousal (from the Time 1 SAM) as the dependent variables. The results indicated that scores on levels of arousal at Time 1 were significantly different between groups, $t(58) = -2.856, p < .01$, with those in the EW group ($M = 4.36, SD = 1.97$) demonstrating greater arousal in comparison to the control group ($M = 5.84, SD = 2.05$). Results also indicated that scores on the level of emotionality of the writing were significantly different between groups, $t(58) = 5.824, p < .01$, with those in the EW group ($M = 5.75, SD = 1.14$) reporting that their writing was more emotional than the control group ($M = 3.47, SD = 1.85$).

Description of Sample

Out of the 75 recruited participants, 4 participants failed to attend all four sessions, resulting in a 95% retention rate. Multiple $t$-tests on outcome measures were performed to investigate whether dropouts were different from completers. Results indicated that there were no differences in baseline scores on any of the four outcome measures between completers and dropouts (all $p$ values $> .31, ns$). After a review of all completed participant packages, 11 participants were excluded from the analyses, resulting in a final sample size of 60 participants (EW = 28, Control = 32). These exclusions were made because participants did not follow
writing instructions properly, or it was later determined that participants did not meet eligibility criteria upon entering the study.

Analyses were conducted to ensure that the EW group did not differ from the control writing group on a number of pre-existing variables. Results indicated that the two writing groups did not differ in terms of age \((p = .938, \text{ ns})\), gender \((p = .429, \text{ ns})\), or education \((p = .312, \text{ ns})\). Given the small number of participants in each of the ethnicity categories, differences on this variable between the EW and control group could not be reliably determined. As a result, Caucasian/Europeans were compared to all other ethnicity groups for this analysis and the results demonstrated that the groups did not differ significantly in terms of ethnicity \((p = .613, \text{ ns})\).

Given the small number of participants in each marital status category, differences on this variable between the EW and control group could not be reliably determined. However, the distribution for marital status appeared to be fairly similar between groups, as can be seen in Table 1.

**Table 1**

*Demographic Information for the EW (n = 28) and Control (n = 32) Group*

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<td>6.3</td>
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</tr>
<tr>
<td></td>
<td>4</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>South Asian</td>
<td>3</td>
<td>10.7</td>
<td></td>
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<tr>
<td></td>
<td>4</td>
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<td></td>
<td>7</td>
<td>11.6</td>
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<td>0.0</td>
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<td>3.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1.7</td>
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</tr>
<tr>
<td>Mixed/Other</td>
<td>5</td>
<td>17.9</td>
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</tr>
<tr>
<td></td>
<td>1</td>
<td>3.1</td>
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<td>6</td>
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<tr>
<td>South Asian</td>
<td>4</td>
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<td></td>
<td>7</td>
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<td>Aboriginal</td>
<td>1</td>
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<tr>
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<td>1</td>
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<tr>
<td>Mixed/Other</td>
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<thead>
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<th>Marital Status</th>
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<tr>
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<td>25</td>
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<td></td>
<td>52</td>
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<td>Common Law</td>
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<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
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<tr>
<td>Divorced</td>
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<td></td>
<td>2</td>
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<table>
<thead>
<tr>
<th>Education</th>
<th>EW</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>High School</td>
<td>11</td>
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<tr>
<td>Diploma or Less</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>28</td>
</tr>
<tr>
<td>College/Univ.</td>
<td>17</td>
</tr>
<tr>
<td>Graduates</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>32</td>
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</table>

### Table 2

Age of Participants in the EW ($n = 28$) and Control ($n = 32$) Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>Max</td>
<td>SD</td>
</tr>
<tr>
<td>Age</td>
<td>18</td>
<td>62</td>
<td>30.39</td>
</tr>
</tbody>
</table>

Given the small number of participants in each category outlining how much participants had previously shared their traumatic experience with others, differences on this variable between the EW and control group could not be reliably determined. As a result, categories were collapsed (i.e., none - a little disclosure was compared to moderate - a lot of disclosure). Results demonstrated that the groups did not differ in terms of how much they previously talked with
others about their traumatic event ($p = .10, \textit{ns}$). Results demonstrated that the groups did not differ in their amount of previous psychotherapy experience ($p = .193, \textit{ns}$). Given the small number of participants in each psychotropic medication category, differences on this variable between the EW and control group could not be reliably determined. However, the distribution for psychotropic medication use appeared to be fairly similar between groups, as can be seen in Table 3.

**Table 3**

*Previous Disclosure and Treatment History for the EW (n = 28) and Control (n = 32) Group*

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW</th>
<th></th>
<th>Control</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Previous Disclosure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>5</td>
<td>17.9</td>
<td>4</td>
<td>12.5</td>
<td>9</td>
<td>15.0</td>
</tr>
<tr>
<td>Little</td>
<td>17</td>
<td>60.7</td>
<td>14</td>
<td>43.8</td>
<td>31</td>
<td>51.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>3</td>
<td>10.7</td>
<td>11</td>
<td>34.4</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td>A lot</td>
<td>3</td>
<td>10.7</td>
<td>3</td>
<td>9.4</td>
<td>6</td>
<td>10.0</td>
</tr>
<tr>
<td>Psychotherapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>28.6</td>
<td>9</td>
<td>28.1</td>
<td>17</td>
<td>28.3</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>71.4</td>
<td>23</td>
<td>71.9</td>
<td>43</td>
<td>71.7</td>
</tr>
<tr>
<td>Medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>10.7</td>
<td>3</td>
<td>9.4</td>
<td>6</td>
<td>10.0</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>89.3</td>
<td>29</td>
<td>90.6</td>
<td>54</td>
<td>90.0</td>
</tr>
</tbody>
</table>
Table 4

*Types of Trauma’s Selected by Total Sample (N = 60)*

<table>
<thead>
<tr>
<th>Type of Trauma</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>15</td>
<td>25.0</td>
</tr>
<tr>
<td>Natural disaster</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Non-sexual assault by someone you know</td>
<td>12</td>
<td>20.0</td>
</tr>
<tr>
<td>Non-sexual assault by a stranger</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Sexual assault by someone you know</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Sexual assault by a stranger</td>
<td>6</td>
<td>10.0</td>
</tr>
<tr>
<td>Military combat</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Sexual contact under 18 by someone &gt;5 yrs older</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Imprisonment</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Torture</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Life threatening illness</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>Other traumatic event</td>
<td>11</td>
<td>18.3</td>
</tr>
</tbody>
</table>

The minimum, maximum, mean, standard deviation, skewness and kurtosis for all outcome measures at Time 1 and Time 2 are presented for the overall sample (see Table 5 and Table 6). The mean and standard deviation for all outcome measures at Time 1 and Time 2 are presented as well by group (see Tables 7 and 8). Although the total sample size was 60, all analyses involving the Pre BDI-II and Post BDI-II are based on a sample size of 59 as a result of 1 participant completing only half of the measure. Also, all analyses involving the Pre PDS and Post PDS are based on a sample of 55 as a result of 5 participants completing this measure at Time 1 and Time 2 with reference to two different traumatic events. In addition, all outcome measures with the exception of the Pre PDS, Pre DERS Non-Acceptance, Pre DERS Goals, Post DERS Goals, Pre DERS Awareness, and Post DERS Awareness were found to be in violation of
assumptions of normality as a result of being positively skewed. Accordingly, the square root transformation (Sqrt) was applied in order to correct the distributions. All subsequent analyses involving these measures use the transformed values. However, for descriptive purposes, the untransformed mean and standard deviation values will be provided in Tables 5, 6, 7, and 8.

Table 5

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre DERS</td>
<td>43.00</td>
<td>166.00</td>
<td>87.20</td>
<td>25.13</td>
<td>0.78</td>
<td>0.93</td>
</tr>
<tr>
<td>Post DERS</td>
<td>42.00</td>
<td>171.00</td>
<td>82.62</td>
<td>24.99</td>
<td>1.17</td>
<td>2.61</td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>1.00</td>
<td>52.00</td>
<td>16.05</td>
<td>10.25</td>
<td>1.26</td>
<td>2.81</td>
</tr>
<tr>
<td>Post BDI-II</td>
<td>0.00</td>
<td>56.00</td>
<td>12.83</td>
<td>10.51</td>
<td>1.97</td>
<td>5.74</td>
</tr>
<tr>
<td>Pre PILL</td>
<td>1.00</td>
<td>51.00</td>
<td>18.03</td>
<td>10.92</td>
<td>0.77</td>
<td>0.64</td>
</tr>
<tr>
<td>Post PILL</td>
<td>0.00</td>
<td>47.00</td>
<td>15.45</td>
<td>11.20</td>
<td>0.94</td>
<td>0.49</td>
</tr>
<tr>
<td>Pre PDS</td>
<td>0.00</td>
<td>43.00</td>
<td>21.33</td>
<td>10.05</td>
<td>-0.02</td>
<td>-0.72</td>
</tr>
<tr>
<td>Post PDS</td>
<td>2.00</td>
<td>42.00</td>
<td>16.89</td>
<td>10.51</td>
<td>0.41</td>
<td>-0.49</td>
</tr>
</tbody>
</table>

Note. a N = 59 due to missing variables on the BDI-II.

Note. b N = 55 due to participants referring to two different traumatic events on the PDS.
Table 6

Descriptive Statistics for DERS Subscales for Total Sample (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Acceptance</td>
<td>6.00</td>
<td>28.00</td>
<td>14.15</td>
<td>5.51</td>
<td>0.44</td>
<td>-0.65</td>
</tr>
<tr>
<td>Post Acceptance</td>
<td>6.00</td>
<td>30.00</td>
<td>12.97</td>
<td>5.75</td>
<td>0.95</td>
<td>0.92</td>
</tr>
<tr>
<td>Pre Goals</td>
<td>6.00</td>
<td>25.00</td>
<td>16.67</td>
<td>4.80</td>
<td>-0.15</td>
<td>-0.69</td>
</tr>
<tr>
<td>Post Goals</td>
<td>5.00</td>
<td>25.00</td>
<td>15.13</td>
<td>5.01</td>
<td>0.02</td>
<td>-0.84</td>
</tr>
<tr>
<td>Pre Impulse</td>
<td>6.00</td>
<td>27.00</td>
<td>12.45</td>
<td>5.54</td>
<td>0.94</td>
<td>0.09</td>
</tr>
<tr>
<td>Post Impulse</td>
<td>6.00</td>
<td>29.00</td>
<td>12.43</td>
<td>5.33</td>
<td>1.31</td>
<td>2.32</td>
</tr>
<tr>
<td>Pre Awareness</td>
<td>6.00</td>
<td>24.00</td>
<td>13.83</td>
<td>4.84</td>
<td>0.22</td>
<td>-0.96</td>
</tr>
<tr>
<td>Post Awareness</td>
<td>6.00</td>
<td>24.00</td>
<td>13.32</td>
<td>4.51</td>
<td>0.22</td>
<td>-0.49</td>
</tr>
<tr>
<td>Pre Strategies</td>
<td>8.00</td>
<td>39.00</td>
<td>18.85</td>
<td>7.20</td>
<td>0.88</td>
<td>0.24</td>
</tr>
<tr>
<td>Post Strategies</td>
<td>8.00</td>
<td>38.00</td>
<td>17.47</td>
<td>7.05</td>
<td>1.06</td>
<td>1.01</td>
</tr>
<tr>
<td>Pre Clarity</td>
<td>5.00</td>
<td>25.00</td>
<td>11.27</td>
<td>4.31</td>
<td>1.00</td>
<td>0.86</td>
</tr>
<tr>
<td>Post Clarity</td>
<td>2.00</td>
<td>25.00</td>
<td>11.13</td>
<td>4.44</td>
<td>0.82</td>
<td>0.82</td>
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</table>

Table 7

Mean Values (Standard Deviations) of Outcome Measures at Baseline and Follow-Up Assessment as a Function of Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW Group (n = 28)</th>
<th>Control (n = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre DERS</td>
<td>83.25 (24.60)</td>
<td>90.66 (25.45)</td>
</tr>
<tr>
<td>Post DERS</td>
<td>79.00 (23.04)</td>
<td>85.78 (26.53)</td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>15.07 (8.31)²</td>
<td>16.88 (11.71)</td>
</tr>
<tr>
<td>Post BDI-II</td>
<td>9.63 (7.34)²</td>
<td>15.53 (12.04)</td>
</tr>
<tr>
<td>Pre PILL</td>
<td>17.32 (8.63)</td>
<td>18.66 (12.70)</td>
</tr>
<tr>
<td>Post PILL</td>
<td>14.57 (8.68)</td>
<td>16.22 (13.11)</td>
</tr>
<tr>
<td>Pre PDS</td>
<td>20.31 (8.19)²</td>
<td>22.24 (11.53)³</td>
</tr>
</tbody>
</table>
Table 8

Mean Values (Standard Deviations) of DERS Subscales at Baseline and Follow-Up Assessment as a Function of Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>EW Group (n = 28)</th>
<th>Control (n = 32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post PDS</td>
<td>14.92 (9.29)</td>
<td>18.66 (11.36)</td>
</tr>
</tbody>
</table>

Note. *n = 27 due to missing variables on the BDI-II.

Note. b, c *n = 26 and 29 respectively due to participants referring to two different traumatic events on the PDS.

Relationship Between Outcome Variables

To examine the relationship between difficulties in emotion regulation and outcome measures, Pearson correlations were computed (see Table 9). The Pre DERS and Post DERS are significantly correlated with all pre and post outcome measures (all *p* values < .01). The magnitude of the correlation coefficients varies between moderately and strongly positive,
indicating that participants with higher emotion regulation difficulty scores also have higher values on all outcome measures pre and post. Specifically, participants who endorse greater difficulties in regulating their emotions at baseline also report more symptoms of depression, posttraumatic stress, and physical symptoms upon entering the study. Additionally, participants who endorse greater difficulties regulating their emotions upon entering the study report higher levels of depression, posttraumatic stress, and physical symptoms at follow-up. Moreover, these results suggest that those participants endorsing greater difficulties in regulating their emotions at follow-up also report higher levels of depression, posttraumatic stress, and physical symptoms at follow-up.

Table 9

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pre DERS&lt;sup&gt;a&lt;/sup&gt;</td>
<td>–</td>
<td>.849**</td>
<td>.474**</td>
<td>.403**</td>
<td>.700**</td>
<td>.704**</td>
<td>.568**</td>
<td>.538**</td>
</tr>
<tr>
<td>2. Post DERS&lt;sup&gt;a&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>.417**</td>
<td>.484**</td>
<td>.704**</td>
<td>.797**</td>
<td>.572**</td>
<td>.548**</td>
</tr>
<tr>
<td>3. Pre PILL&lt;sup&gt;a&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>.826**</td>
<td>.435**</td>
<td>.292*</td>
<td>.459**</td>
<td>.467**</td>
</tr>
<tr>
<td>4. Post PILL&lt;sup&gt;a&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>.336**</td>
<td>.359**</td>
<td>.407**</td>
<td>.463**</td>
</tr>
<tr>
<td>5. Pre BDI-II&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>.714**</td>
<td>.715**</td>
<td>.414**</td>
</tr>
<tr>
<td>6. Post BDI-II&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>.593**</td>
<td>.589**</td>
</tr>
<tr>
<td>7. Pre PDS&lt;sup&gt;c&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>.638**</td>
</tr>
<tr>
<td>8. Post PDS&lt;sup&gt;ac&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*Note.* *p* < .05, **p** < .01

*Note.* <sup>a</sup> Values derived from square root (Sqrt) transformation to correct for violations in assumptions of normality.

*Note.* <sup>b</sup> *N* = 59 due to missing variables on the BDI-II.

*Note.* <sup>c</sup> *N* = 55 due to participants referring to two different traumatic events on the PDS.
It is important to mention that emotion regulation abilities at baseline and follow-up were strongly positively correlated, suggesting that if there is change in emotion regulation abilities, then this change is very similar for all participants. As expected, Pearson correlations were computed for the DERS subscales at pre and post and it was discovered that all of the subscales were significantly correlated (all $p$ values < .05). The magnitude of the correlation coefficients between the subscales varied between moderately and strongly positive, indicating that participants with higher emotion regulation difficulty scores on one subscale also had higher scores on other subscales.

Finally, to examine the relationship between the other outcome measures (i.e., BDI-II, PILL, and PDS), Pearson correlations were also computed (see Table 9). All measures were found to correlate positively and strongly (all $p$ values < .05) both at baseline and at follow up. This suggests that high scores on one measure (e.g., high levels of posttraumatic stress) are associated with high scores on the other measures (e.g., high levels of depression and physical symptoms) upon entering the study as well as at follow-up.

**Comparison of Baseline Scores on Outcome Measures Between Groups**

In order to ensure that groups did not differ on any of the outcome measures at baseline, a series of independent samples $t$-tests were performed using group (EW versus control) as the independent variable and Pre PDS, Pre BDI-II, Pre PILL and Pre DERS Total as the dependent variables. As shown in Table 10, all $t$-tests were nonsignificant (all $p$ values > 0.25). A series of independent samples $t$-tests were also performed using group (EW versus control) as the independent variables and the six DERS subscale scores at baseline as the dependent variables. Results also indicated that all $t$-tests were non-significant (all $p$ values > 0.25). Accordingly, it can be assumed that both groups were similar on all measures at baseline.
### Table 10

*Comparison of Expressive Writing (n = 28) and Control (n = 32) Groups on Emotion Regulation and All Outcome Measures at Baseline*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>$T$</th>
<th>$Df$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre DERS$^a$</td>
<td></td>
<td></td>
<td>-1.142</td>
<td>58</td>
<td>.258</td>
</tr>
<tr>
<td>EW</td>
<td>83.25</td>
<td>24.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>90.66</td>
<td>25.45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PILL$^a$</td>
<td></td>
<td></td>
<td>-.469</td>
<td>58</td>
<td>.641</td>
</tr>
<tr>
<td>EW</td>
<td>17.32</td>
<td>8.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>18.66</td>
<td>12.70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II$^b$</td>
<td></td>
<td></td>
<td>-.669</td>
<td>57</td>
<td>.506</td>
</tr>
<tr>
<td>EW</td>
<td>15.07</td>
<td>8.31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>16.88</td>
<td>11.71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS$^c$</td>
<td></td>
<td></td>
<td>-.710</td>
<td>53</td>
<td>.481</td>
</tr>
<tr>
<td>EW</td>
<td>20.31</td>
<td>8.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>22.24</td>
<td>11.53</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* $^a$Values derived from square root (Sqrt) transformation to correct for violations in assumptions of normality.

*Note.* $^b$ $N = 59$ due to missing variables on the BDI-II.

*Note.* $^c$ $N = 55$ due to participants referring to two different traumatic events on the PDS.

### Testing the Effects of Treatment as well as Emotion Regulation as a Moderator of the Effect of Treatment

**BDI-II analyses.**

*BDI-II analyses with DERS total.* As shown in Table 11, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre BDI-II, Group, Pre DERS, and the interaction of Pre DERS by Group significantly predicts scores on Post BDI-II. It is important to mention that estimates provided for Pre BDI-II, Pre DERS, and Post BDI-II were...
generated by using their square root transformed values. In Step 1, Pre BDI-II scores were found to significantly predict Post BDI-II scores, $R^2 = .510$, $F_{(1, 57)} = 59.281$, $p < .01$. This indicates that Pre BDI-II accounts for 51% of variance in Post BDI-II scores. In Step 2, Group was found to significantly predict Post BDI-II scores when controlling for Pre BDI-II, $\Delta R^2 = .045$, $F_{(1, 56)} = 5.601$, $p < .05$. This indicates that Group explains 4.5% of the variance in Post BDI-II scores. In Step 3, Pre DERS was found to significantly predict Post BDI-II scores when controlling for Pre BDI-II and Group, $\Delta R^2 = .069$, $F_{(1, 55)} = 10.122$, $p < .01$. This indicates that Pre DERS explains almost 7% of the variance in Post BDI-II scores. In Step 4, the interaction of Pre DERS by Group was non-significant, controlling for Pre BDI-II, Group, and Pre DERS, $\Delta R^2 = .006$, $F_{(1, 54)} = .912$, $p = .344$. Overall, the linear combination of all four predictors explained 63% of the variance in Post BDI-II scores.

**Table 11**

*Summary of Hierarchical Regression Analysis for Predicting Post BDI-II Scores Using Pre BDI-II, Group, Pre DERS, and the Pre DERS by Group Interaction in the Model (N = 59)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.812**</td>
<td>.105</td>
<td>.714</td>
</tr>
<tr>
<td>Intercept</td>
<td>.195</td>
<td>.422</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.792**</td>
<td>.102</td>
<td>.697</td>
</tr>
<tr>
<td>Group</td>
<td>-.611*</td>
<td>.258</td>
<td>-.212</td>
</tr>
<tr>
<td>Intercept</td>
<td>.550</td>
<td>.433</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.500**</td>
<td>.132</td>
<td>.440</td>
</tr>
<tr>
<td>Group</td>
<td>-.524*</td>
<td>.241</td>
<td>-.182</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Pre DERS</td>
<td>.407**</td>
<td>.128</td>
<td>.371</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.611</td>
<td>.522</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.474**</td>
<td>.135</td>
<td>.417</td>
</tr>
<tr>
<td>Group</td>
<td>-.523*</td>
<td>.241</td>
<td>-.181</td>
</tr>
<tr>
<td>Pre DERS</td>
<td>.509**</td>
<td>.167</td>
<td>.464</td>
</tr>
<tr>
<td>Pre DERS x Group</td>
<td>-.179</td>
<td>.188</td>
<td>-.112</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.694</td>
<td>1.529</td>
<td></td>
</tr>
</tbody>
</table>

Note. All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, and Pre DERS.

Note. *p < .05, **p < .01

Note. B = partial regression coefficient; SE B = standard error of B; β = standardized regression coefficient; $R^2 = .510$ for Step 1 ($p < .01$); $\Delta R^2 = .045$ for Step 2 ($p < .05$); $\Delta R^2 = .069$ for Step 3 ($p < .01$); $\Delta R^2 = .006$ for Step 4 ($p > .05$, ns).

Examining the regression coefficients in Step 4, it is evident that Pre BDI-II scores significantly predict Post BDI-II scores, such that a one unit decrease in Pre BDI-II is associated with a .474 decrease in Post BDI-II scores, controlling for all other predictors. Further, being in the EW group was found to predict a significant decrease of .523 units in Post BDI-II scores, controlling for all other predictors. A one unit decrease in Pre DERS scores is significantly associated with a .509 unit decrease in Post BDI-II scores, controlling for all other predictors. Finally, the Pre DERS by Group interaction was found to predict a .179 unit decrease in Post BDI-II scores, controlling for all other predictors. This effect, however, was not significant.

Looking at standardized coefficients, or beta weights, it can be seen that Pre DERS is the most influential predictor of Post BDI-II scores, followed by Pre BDI-II, Group, and then the interaction of Pre DERS by Group.
With regards to the effectiveness of the two writing conditions, these findings suggest that after controlling for baseline depression levels and emotion regulation abilities, the EW group demonstrated significantly greater improvements in their depressive symptoms in comparison to the control group. This effect accounted for 3.24% of the variance in the final model. Additionally, in regards to the predictive value of emotion regulation abilities at baseline, individuals with greater abilities to regulate their emotions at baseline showed significantly lower levels of depressive symptoms at follow-up after controlling for baseline depression and group, and this effect was similar in the EW and control groups. Baseline levels of emotion regulation accounted for 6.4% of the variance in the final model. Since the results did not demonstrate a significant interaction between group and baseline emotion regulation abilities, however, the moderation hypothesis was not confirmed.

**BDI-II analyses with DERS subscales.** As already mentioned, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of Pre BDI-II, Group, (the Pre DERS subscale), and the interaction of (Pre DERS subscale) by Group significantly predicts scores on Post BDI-II. These analyses were conducted in order to examine whether any of the DERS subscales moderated the effect of treatment. Results of many of the DERS subscale analyses in relation to the BDI-II indicated no significant main subscale effects or any significant group by subscale effects. Specifically, no significant results were found in the final models for Non-Acceptance, Impulse Control, Awareness, or Clarity (all $p$-values > .05). Therefore, results for Goals and Strategies subscales will be reported only.

**BDI-II analyses with goals subscale as a potential moderator.** As shown in Table 12, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre BDI-II, Group, Pre Goals, and the interaction of Pre Goals by Group significantly predicts scores
on Post BDI-II. It is important to mention that estimates provided for Pre BDI-II and Post BDI-II were generated by using their square root transformed values. In Step 1, Pre BDI-II scores were found to significantly predict Post BDI-II scores, $R^2 = .510$, $F_{(1, 57)} = 59.281$, $p < .01$. This indicates that Pre BDI-II accounts for 51% of variance in Post BDI-II scores. In Step 2, Group was found to significantly predict Post BDI-II scores when controlling for Pre BDI-II, $\Delta R^2 = .045$, $F_{(1, 56)} = 5.601$, $p < .05$. This indicates that Group explains 4.5% of the variance in Post BDI-II scores. In Step 3, Pre Goals was found to predict Post BDI-II scores when controlling for Pre BDI-II and Group, although this effect was only approaching significance $\Delta R^2 = .028$, $F_{(1, 55)} = 3.371$, $p = .059$. This indicates that Pre Goals explains almost 3% of the variance in Post BDI-II scores. In Step 4, the interaction of Pre Goals by Group was non-significant, controlling for Pre BDI-II, Group, and Pre Goals, $\Delta R^2 = .010$, $F_{(1, 54)} = 1.371$, $p = .247$. Overall, the linear combination of all four predictors explained 59.3% of the variance in Post BDI-II scores.

**Table 12**

*Summary of Hierarchical Regression Analysis for Predicting Post BDI-II Scores Using Pre BDI-II, Group, Pre Goals, and the Pre Goals by Group Interaction in the Model (N = 59)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.812**</td>
<td>.105</td>
<td>.714</td>
</tr>
<tr>
<td>Intercept</td>
<td>.195</td>
<td>.422</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.792**</td>
<td>.102</td>
<td>.697</td>
</tr>
<tr>
<td>Group</td>
<td>-.611*</td>
<td>.258</td>
<td>-.212</td>
</tr>
<tr>
<td>Intercept</td>
<td>.550</td>
<td>.433</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.664**</td>
<td>.119</td>
<td>.584</td>
</tr>
<tr>
<td>Variable</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
<td>------</td>
<td>----</td>
</tr>
<tr>
<td>Group</td>
<td>-.560*</td>
<td>.254</td>
<td>-.194</td>
</tr>
<tr>
<td>Pre Goals</td>
<td>.062</td>
<td>.032</td>
<td>.204</td>
</tr>
<tr>
<td>Intercept</td>
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<td>.484</td>
<td></td>
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</table>

Step 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre BDI-II</td>
<td>.474**</td>
<td>.135</td>
<td>.417</td>
</tr>
<tr>
<td>Group</td>
<td>-.523*</td>
<td>.241</td>
<td>-.181</td>
</tr>
<tr>
<td>Pre Goals</td>
<td>.509*</td>
<td>.167</td>
<td>.464</td>
</tr>
<tr>
<td>Pre Goals x Group</td>
<td>-.179</td>
<td>.188</td>
<td>-.112</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.694</td>
<td>1.529</td>
<td></td>
</tr>
</tbody>
</table>

Note. All estimates are provided using Sqrt transformation for Pre BDI-II and Post BDI-II.

Note. *p < .05, **p < .01

Note. B = partial regression coefficient; SE B = standard error of B; β = standardized regression coefficient; $R^2 = .510$ for Step 1 ($p < .01$); $\Delta R^2 = .045$ for Step 2 ($p < .05$); $\Delta R^2 = .028$ for Step 3 ($p > .05, ns$); $\Delta R^2 = .01$ for Step 4 ($p > .05, ns$).

Examining the regression coefficients in Step 4, it is evident that Pre BDI-II scores significantly predict Post BDI-II scores, such that a one unit decrease in Pre BDI-II is associated with a .633 unit decrease in Post BDI-II scores, controlling for all other predictors. Further, being in the EW group was found to predict a significant decrease of .558 units in Post BDI-II scores, controlling for all other predictors. A one unit decrease in Pre Goals scores is associated with a significant .098 unit decrease in Post BDI-II scores, controlling for all other predictors. Finally, the Pre Goals by Group interaction was found to predict a .064 unit decrease in Post BDI-II scores, controlling for all other predictors. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre BDI-II is the most influential predictor of Post BDI-II scores, followed by Pre Goals, Group, and then the interaction of Pre Goals by Group.
It is interesting to note that although in Model 3 Pre Goals was not a significant predictor of Post BDI-II, in Model 4, when the interaction term between Group and Pre Goals was added, the Pre Goals effect became significant (although the interaction was not significant). A possible explanation of this is the relatively high correlations (about .6-.7) between Pre BDI-II, Pre Goals and the interaction term. Indeed, in Model 3, the partial correlation for Pre Goals is .252, and in Model 4, in the presence of interaction term it is .287, which indicates that in Model 4 Pre Goals explained more unique variance in the outcome variable.

With regards to the predictive value of Goals at baseline, individuals with greater abilities on this emotion regulation subscale at baseline demonstrated significantly lower levels of depressive symptoms at follow-up after controlling for baseline depression and group, and this effect was similar in the EW and control groups. Pre Goals accounted for 3.7% of the variance in the final model. Since the results did not demonstrate a significant interaction between group and baseline Goals the moderation hypothesis was not confirmed.

**BDI-II analyses with strategies subscale as a potential moderator.** As shown in Table 13, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre BDI-II, Group, Pre Strategies, and the interaction of Pre Strategies by Group significantly predicts scores on Post BDI-II. It is important to mention that estimates provided for Pre BDI-II, Post BDI-II, and Pre Strategies were generated by using their square root transformed values. In Step 1, Pre BDI-II scores were found to significantly predict Post BDI-II scores, $R^2 = .510, F_{(1, 57)} = 59.281, p < .01$. This indicates that Pre BDI-II accounts for 51% of variance in Post BDI-II scores. In Step 2, Group was found to significantly predict Post BDI-II scores when controlling for Pre BDI-II, $\Delta R^2 = .045, F_{(1, 56)} = 5.601, p < .05$. This indicates that Group explains 4.5% of the variance in Post BDI-II scores. In Step 3, Pre Strategies was found to significantly predict
Post BDI-II scores when controlling for Pre BDI-II and Group, $\Delta R^2 = .060$, $F(1, 55) = 8.532$, $p = .005$. This indicates that Pre Strategies explains 6% of the variance in Post BDI-II scores. In Step 4, the interaction of Pre Strategies by Group was non-significant, controlling for Pre BDI-II, Group, and Pre Strategies, $\Delta R^2 = .001$, $F(1, 54) = .099$, $p = .247$. Overall, the linear combination of all four predictors explained 61.5% of the variance in Post BDI-II scores.

**Table 13**

*Summary of Hierarchical Regression Analysis for Predicting Post BDI-II Scores Using Pre BDI-II, Group, Pre Strategies, and the Pre Strategies by Group Interaction in the Model (N = 59)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.812**</td>
<td>.105</td>
<td>.714</td>
</tr>
<tr>
<td>Intercept</td>
<td>.195</td>
<td>.422</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.792**</td>
<td>.102</td>
<td>.697</td>
</tr>
<tr>
<td>Group</td>
<td>-.611*</td>
<td>.258</td>
<td>-.212</td>
</tr>
<tr>
<td>Intercept</td>
<td>.550</td>
<td>.433</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.602**</td>
<td>.116</td>
<td>.529</td>
</tr>
<tr>
<td>Group</td>
<td>-.547*</td>
<td>.243</td>
<td>-.190</td>
</tr>
<tr>
<td>Pre Strategies</td>
<td>.539*</td>
<td>.185</td>
<td>.298</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.237</td>
<td>.470</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre BDI-II</td>
<td>.595**</td>
<td>.119</td>
<td>.523</td>
</tr>
<tr>
<td>Group</td>
<td>-.547*</td>
<td>.246</td>
<td>-.190</td>
</tr>
<tr>
<td>Pre Strategies</td>
<td>.593*</td>
<td>.253</td>
<td>.328</td>
</tr>
</tbody>
</table>
Examine the regression coefficients in Step 4, it is evident that Pre BDI-II scores significantly predict Post BDI-II scores, such that a one unit decrease in Pre BDI-II is associated with a .595 unit decrease in Post BDI-II scores, controlling for all other predictors. Further, being in the EW group was found to predict a significant decrease of .547 units in Post BDI-II scores, controlling for all other predictors. A one unit decrease in Pre Strategies scores is associated with a significant .593 unit decrease in Post BDI-II scores, controlling for all other predictors. Finally, the Pre Strategies by Group interaction was found to predict a .099 unit decrease in Post BDI-II scores, controlling for all other predictors. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre BDI-II is the most influential predictor of Post BDI-II scores, followed by Pre Strategies, Group, and then the interaction of Pre Strategies by Group.

With regards to the predictive value of Strategies at baseline, individuals with greater abilities on this emotion regulation subscale at baseline demonstrated significantly lower levels of depressive symptoms at follow-up after controlling for baseline depression and group, and this effect was similar in the EW and control groups. Pre Strategies accounted for 3.9% of the variance in the final model. Since the results did not demonstrate a significant interaction between group and baseline Strategies the moderation hypothesis was not confirmed.
PDS analyses.

**PDS analyses with DERS total.** As shown in Table 14, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre PDS, Group, Pre DERS, and the interaction of Pre DERS by Group significantly predicts scores on Post PDS. It is important to mention that estimates provided for Pre DERS and Post PDS were generated by using their square root transformed values. In Step 1, Pre PDS scores were found to significantly predict Post PDS scores, $R^2 = .408$, $F_{(1, 53)} = 36.463$, $p < .01$. This indicates that Pre PDS accounts for approximately 41% of variance in Post PDS scores. In Step 2, Group did not significantly predict Post PDS scores when controlling for Pre PDS, $\Delta R^2 = .009$, $F_{(1, 52)} = .775$, $p = .383$. This indicates that Group explains less than 1% of the variance in Post PDS scores. In Step 3, Pre DERS was only marginally predictive (i.e., approaching significance) of Post PDS scores when controlling for Pre PDS and Group, $\Delta R^2 = .041$, $F_{(1, 51)} = 3.883$, $p = .054$. This indicates that Pre DERS explains just over 4% of the variance in Post PDS scores. In Step 4, the interaction of Pre DERS by Group was also non-significant, controlling for Pre PDS, Group, and Pre DERS, $\Delta R^2 = .039$, $F_{(1, 50)} = 3.840$, $p = .056$. Overall, the linear combination of all four predictors explained 49.6% of the variance in Post PDS scores.

**Table 14**

**Summary of Hierarchical Regression Analysis for Predicting Post PDS Scores Using Pre PDS, Group, Pre DERS, and the Pre DERS by Group Interaction in the Model (N = 55)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.088**</td>
<td>.015</td>
<td>.638</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.008</td>
<td>.341</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Examining the regression coefficients in Step 4, it is evident that Pre PDS scores significantly predict Post PDS scores, such that a one unit decrease in Pre PDS is associated with a .059 unit decrease in Post PDS scores, controlling for all other predictors. Further, being in the EW group was found to predict a decrease of .197 units in Post PDS scores, controlling for all other predictors. This effect, however, was not significant. Results also demonstrated that a one unit decrease in Pre DERS scores is significantly associated with a .509 unit decrease in Post PDS scores, controlling for all other predictors. Finally, the Pre DERS by Group interaction was
found to predict a .436 unit decrease in Post PDS scores, controlling for all other predictors. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre DERS is the most influential predictor of Post PDS scores, followed by Pre PDS, the interaction of Pre DERS by Group, and then Group.

It is interesting to note that although in Model 3 Pre DERS was not a significant predictor of Post PDS, in Model 4, when the interaction term between group and Pre DERS was added, the Pre DERS effect became significant (although the interaction was not significant). A possible explanation of this is the relatively high correlations (about .6-.7) between Pre PDS, Pre DERS and interaction term. Indeed, in Model 3, the partial correlation for Pre DERS is .266, and in Model 4, in the presence of interaction term it is .370, which indicates that in Model 4 pre-DERS explained more unique variance in the outcome variable.

With regards to the effectiveness of the two writing conditions, these findings suggest that after controlling for baseline posttraumatic stress levels and emotion regulation abilities, the EW group did not demonstrate significantly greater improvements in their posttraumatic stress symptoms in comparison to the control group. However, in regards to the predictive value of emotion regulation abilities at baseline, individuals with greater abilities to regulate their emotions at baseline showed significantly lower levels of posttraumatic stress symptoms at follow-up after controlling for baseline levels of posttraumatic stress and group, and this effect was similar in the EW and control groups. Emotion regulation accounted for 8% of the variance in the final model. Since the results did not demonstrate a significant interaction between group and baseline emotion regulation abilities, the moderation hypothesis was not confirmed.

Although the EW group did not demonstrate significantly greater improvements in their posttraumatic stress symptoms in comparison to the control group, for exploratory purposes a
Wilcoxon test was conducted to evaluate whether participants’ scores on the PDS differed from Pre to Post, regardless of group. Given the need to account for the non-normal distribution of the untransformed Post PDS score, the non-parametric Wilcoxon test was used. The results indicated that the participants scores for the entire sample, regardless of group, significantly decreased from Pre ($M = 21.33$, $SD = 10.05$) to Post ($M = 16.89$, $SD = 10.51$), $p < .01$. These results suggest that participants showed significant improvements in their posttraumatic stress symptoms as a result of taking part in the study irrespective of writing condition.

**PDS analyses with DERS subscales.** As already mentioned, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of Pre PDS, Group, (the Pre DERS subscale), and the interaction of (Pre DERS subscale) by Group significantly predicts scores on Post PDS. These analyses were conducted in order to examine whether any of the DERS subscales moderated the effect of treatment. Results of many of the DERS subscale analyses indicated no significant main subscale effects, or any significant group by subscale effects. Specifically, no significant results were found in the final models for Non-Acceptance, Impulse Control, or Awareness (all $p$-values > .05). Therefore, results for Goals, Strategies, and Clarity subscales will be reported only.

**PDS analyses with goals subscale as a potential moderator.** As shown in Table 15, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre PDS, Group, Pre Goals, and the interaction of Pre Goals by Group significantly predicts scores on Post PDS. It is important to mention that estimates provided for Post PDS were generated by using its square root transformed values. In Step 1, Pre PDS scores were found to significantly predict Post PDS scores, $R^2 = .408$, $F_{(1, 53)} = 36.463$, $p < .01$. This indicates that Pre PDS accounts for approximately 41% of variance in Post PDS scores. In Step 2, Group did not
significantly predict Post PDS scores when controlling for Pre PDS, $\Delta R^2 = .009$, $F(1, 52) = .775$, $p = .383$. This indicates that Group explains less than 1% of the variance in Post PDS scores. In Step 3, Pre Goals was only marginally predictive (i.e., approaching significance) of Post PDS scores when controlling for Pre PDS and Group, $\Delta R^2 = .037$, $F(1, 51) = 3.478$, $p = .068$. This indicates that Pre Goals explains almost 4% of the variance in Post PDS scores. In Step 4, the interaction of Pre Goals by Group was significant, controlling for Pre PDS, Group, and Pre Goals, $\Delta R^2 = .042$, $F(1, 50) = 4.211$, $p < .05$. Overall, the linear combination of all four predictors explained 49.6% of the variance in Post PDS scores.

Table 15

<table>
<thead>
<tr>
<th>Table 15</th>
<th>Summary of Hierarchical Regression Analysis for Predicting Post PDS Scores Using Pre PDS, Group, Pre Goals, and the Pre Goals by Group Interaction in the Model (N = 55)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>$B$</td>
</tr>
<tr>
<td>----------</td>
<td>-----</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.088**</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.008</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.086**</td>
</tr>
<tr>
<td>Group</td>
<td>-.256</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.155</td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.076**</td>
</tr>
<tr>
<td>Group</td>
<td>-.192</td>
</tr>
<tr>
<td>Pre Goals</td>
<td>.062</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.343</td>
</tr>
<tr>
<td>Step 4</td>
<td></td>
</tr>
</tbody>
</table>
Examining the regression coefficients in Step 4, it is evident that Pre PDS scores significantly predict Post PDS scores, such that a one unit decrease in Pre PDS is associated with a .066 unit decrease in Post PDS scores, controlling for all other predictors. Further, being in the EW group was found to predict a decrease of .205 units in Post PDS scores, controlling for all other predictors. However, this effect was non-significant. A one unit decrease in Pre Goals scores is associated with a significant .136 unit decrease in Post PDS scores, controlling for all other predictors. Finally, the Pre Goals by Group interaction was found to significantly predict a .131 unit decrease in Post PDS scores, controlling for all other predictors. Looking at standardized coefficients, or beta weights, it can be seen that Pre PDS is the most influential predictor of Post PDS scores, followed by Pre Goals, the interaction of Pre Goals by Group, and then Group.

It is interesting to note that although in Model 3 Pre Goals was not a significant predictor of Post PDS, in model 4, when the interaction term between group and Pre Goals was added, the Pre Goals effect became significant. A possible explanation of this is the relatively high

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre PDS</td>
<td>.066**</td>
<td>.016</td>
<td>.478</td>
</tr>
<tr>
<td>Group</td>
<td>-.205</td>
<td>.278</td>
<td>-.075</td>
</tr>
<tr>
<td>Pre Goals</td>
<td>.136*</td>
<td>.048</td>
<td>.458</td>
</tr>
<tr>
<td>Pre Goals x Group</td>
<td>-.131*</td>
<td>.064</td>
<td>-.311</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.531</td>
<td>.385</td>
<td></td>
</tr>
</tbody>
</table>

Note. All estimates are provided using Sqrt transformation for Post PDS.

Note. *p < .05, **p < .01

Note. B = partial regression coefficient; SE B = standard error of B; β = standardized regression coefficient;
R² = .408 for Step 1 (p < .01); ΔR² = .009 for Step 2 (p > .05, ns); ΔR² = .037 for Step 3 (p = .068, ns); ΔR² = .042 for Step 4 (p < .05).
correlations (about .4-.7) between Pre PDS, Pre Goals and the interaction term. Indeed, in Model 3, the partial correlation for Pre Goals is .253, and in Model 4, in the presence of interaction term it is .369, which indicates that in Model 4 Pre Goals explained more unique variance in the outcome variable.

With regards to the predictive value of Goals at baseline, individuals with greater abilities on this emotion regulation subscale at baseline demonstrated significantly lower levels of posttraumatic stress symptoms at follow-up after controlling for baseline posttraumatic stress and group, and this effect was similar in the EW and control groups. Pre Goals accounted for 8% of the variance in the final model.

Since the results demonstrated a significant interaction between Group and Pre Goals, suggesting that Pre Goals scores differentially predict outcome for the EW and control group, further analyses were conducted to examine moderation. The simple slopes of significant two-way interactions were investigated following the guidelines described by O’Conner (1998). To begin, Pre PDS and Pre Goals were both residualized on Post PDS scores and the necessary variables were entered into a program developed by O’Conner (see https://people.ok.ubc.ca/brioconn/simple/simple.html). The $R^2$ values associated with the interaction effects of Group and Pre Goals and its associated model were found to be significant. Specifically, an examination of the standardized coefficients revealed that the main effect was moderated by a two way Group X Pre Goals interaction. The simple slope was significant for the control group ($B = .54, SE B = .21, \beta = .54, t(54) = 2.58, p < .05$), but not for the EW group ($B = .06, SE B = .17, \beta = .38, t(54) = .38, p = .70, ns$). These results suggest that unlike EW participants who demonstrated similar improvements on PDS scores regardless of their level of baseline difficulties with goal setting, those in the control group with greater difficulties with
goal setting demonstrated less improvements on PDS scores in comparison to those with less difficulties with goal setting.

PDS analyses with strategies subscale as a potential moderator. As shown in Table 16, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre PDS, Group, Pre Strategies, and the interaction of Pre Strategies by Group significantly predicts scores on Post PDS. It is important to mention that estimates provided for Pre Strategies and Post PDS were generated by using their square root transformed values. In Step 1, Pre PDS scores were found to significantly predict Post PDS scores, $R^2 = .408$, $F_{(1, 53)} = 36.463$, $p < .01$. This indicates that Pre PDS accounts for approximately 41% of variance in Post PDS scores. In Step 2, Group did not significantly predict Post PDS scores when controlling for Pre PDS, $\Delta R^2 = .009$, $F_{(1, 52)} = .775$, $p = .383$. This indicates that Group explains less than 1% of the variance in Post PDS scores. In Step 3, Pre Strategies was only marginally predictive (i.e., approaching significance) of Post PDS scores when controlling for Pre PDS and Group, $\Delta R^2 = .034$, $F_{(1, 51)} = 3.200$, $p = .080$. This indicates that Pre Strategies explains just over 3% of the variance in Post PDS scores. In Step 4, the interaction of Pre Strategies by Group was also non-significant, controlling for Pre PDS, Group, and Pre Strategies, $\Delta R^2 = .021$, $F_{(1, 50)} = 2.030$, $p = .160$. Overall, the linear combination of all four predictors explained 47.2% of the variance in Post PDS scores.

Table 16
Summary of Hierarchical Regression Analysis for Predicting Post PDS Scores Using Pre PDS, Group, Pre Strategies, and the Pre Strategies by Group Interaction in the Model (N = 55)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$\beta$</th>
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</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.088**</td>
<td>.015</td>
<td>.638</td>
</tr>
<tr>
<td>Variable</td>
<td>$B$</td>
<td>$SE\ B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.008</td>
<td>.341</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.086**</td>
<td>.015</td>
<td>.629</td>
</tr>
<tr>
<td>Group</td>
<td>-.256</td>
<td>.291</td>
<td>-.094</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.155</td>
<td>.381</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.076**</td>
<td>.015</td>
<td>.555</td>
</tr>
<tr>
<td>Group</td>
<td>-.192</td>
<td>.287</td>
<td>-.070</td>
</tr>
<tr>
<td>Pre Strategies</td>
<td>.062</td>
<td>.033</td>
<td>.209</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.343</td>
<td>.386</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.066**</td>
<td>.016</td>
<td>.478</td>
</tr>
<tr>
<td>Group</td>
<td>-.205</td>
<td>.278</td>
<td>-.075</td>
</tr>
<tr>
<td>Pre Strategies</td>
<td>.136*</td>
<td>.048</td>
<td>.458</td>
</tr>
<tr>
<td>Pre Strategies x Group</td>
<td>-.131*</td>
<td>.064</td>
<td>-.311</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.531</td>
<td>.385</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre Strategies and Post PDS.

*Note.* $^*p < .05, **p < .01$

*Note.* $B$ = partial regression coefficient; $SE\ B$ = standard error of $B$; $\beta$ = standardized regression coefficient; $R^2 = .408$ for Step 1 ($p < .01$); $\Delta R^2 = .009$ for Step 2 ($p > .05$, ns); $\Delta R^2 = .037$ for Step 3 ($p = .068$, ns); $\Delta R^2 = .042$ for Step 4 ($p < .05$).

Examining the regression coefficients in Step 4, it is evident that Pre PDS scores significantly predict Post PDS scores, such that a one unit decrease in Pre PDS is associated with a .069 unit decrease in Post PDS scores, controlling for all other predictors. Further, being in the EW group was found to predict a decrease of .198 units in Post PDS scores, controlling for all other predictors. However, this effect was non-significant. A one unit decrease in Pre Strategies
scores is associated with a significant .627 unit decrease in Post PDS scores, controlling for all other predictors. Finally, the Pre Strategies by Group interaction was found to predict a .514 unit decrease in Post PDS scores, controlling for all other predictors. However, this effect was non-significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre PDS is the most influential predictor of Post PDS scores, followed by Pre Strategies, the interaction of Pre Strategies by Group, and then Group.

It is interesting to note that although in Model 3 Pre Strategies was not a significant predictor of Post PDS, in Model 4, when the interaction term between group and Pre Strategies was added, the Pre Strategies effect became significant. A possible explanation of this is the relatively high correlations (about .5-.7) between Pre PDS, Pre Strategies and the interaction term. Indeed, in Model 3, the partial correlation for Pre Strategies is .243, and in Model 4, in the presence of interaction term it is .308, which indicates that in Model 4 Pre Strategies explained more unique variance in the outcome variable.

With regards to the predictive value of Strategies at baseline, individuals with greater abilities on this emotion regulation subscale at baseline demonstrated significantly lower levels of posttraumatic stress symptoms at follow-up after controlling for baseline posttraumatic stress and group, and this effect was similar in the EW and control groups. Pre Strategies accounted for 5.5% of the variance in the final model.

*PDS analyses with clarity subscale as a potential moderator.* As shown in Table 17, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre PDS, Group, Pre Clarity, and the interaction of Pre Clarity by Group significantly predicts scores on Post PDS. It is important to mention that estimates provided for Post PDS, Pre Clarity and Post Clarity were generated by using their square root transformed values. In Step 1, Pre PDS
scores were found to significantly predict Post PDS scores, $R^2 = .408$, $F(1, 53) = 36.463$, $p < .01$. This indicates that Pre PDS accounts for approximately 41% of variance in Post PDS scores. In Step 2, Group did not significantly predict Post PDS scores when controlling for Pre PDS, $\Delta R^2 = .009$, $F(1, 52) = .775$, $p = .383$. This indicates that Group explains less than 1% of the variance in Post PDS scores. In Step 3, Pre Clarity did not predict Post PDS scores when controlling for Pre PDS and Group, $\Delta R^2 = .000$, $F(1, 51) = .044$, $p = .835$. In Step 4, the interaction of Pre Clarity by Group was significant, controlling for Pre PDS, Group, and Pre Clarity, $\Delta R^2 = .046$, $F(1, 50) = 4.308$, $p < .05$. Overall, the linear combination of all four predictors explained 46.3% of the variance in Post PDS scores.

Table 17
Summary of Hierarchical Regression Analysis for Predicting Post PDS Scores Using Pre PDS, Group, Pre Clarity, and the Pre Clarity by Group Interaction in the Model ($N = 55$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.088**</td>
<td>.015</td>
<td>.638</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.008</td>
<td>.341</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.086**</td>
<td>.015</td>
<td>.629</td>
</tr>
<tr>
<td>Group</td>
<td>-.256</td>
<td>.291</td>
<td>-.094</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.155</td>
<td>.381</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PDS</td>
<td>.085**</td>
<td>.016</td>
<td>.620</td>
</tr>
<tr>
<td>Group</td>
<td>-.255</td>
<td>.294</td>
<td>-.093</td>
</tr>
<tr>
<td>Pre Clarity</td>
<td>.052</td>
<td>.250</td>
<td>.024</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.181</td>
<td>.404</td>
<td></td>
</tr>
</tbody>
</table>
Examining the regression coefficients in Step 4, it is evident that Pre PDS scores significantly predict Post PDS scores, such that a one unit decrease in Pre PDS is associated with a .082 unit decrease in Post PDS scores, controlling for all other predictors. Further, being in the EW group was found to predict a decrease of .262 units in Post PDS scores, controlling for all other predictors. However, this effect was non-significant. A one unit decrease in Pre Clarity scores is associated with a .512 unit decrease in Post PDS scores, controlling for all other predictors. However, this effect was also non-significant. Finally, the Pre Clarity by Group interaction was found to significantly predict a .941 unit decrease in Post PDS scores, controlling for all other predictors. Looking at standardized coefficients, or beta weights, it can be seen that Pre PDS is the most influential predictor of Post PDS scores, followed by the interaction of Pre Clarity by Group, Pre Clarity, and then Group.

With regards to the predictive value of baseline clarity scores, results did not find any support that those individuals with greater abilities on this subscale at baseline demonstrated

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE$ $B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre PDS</td>
<td>.082**</td>
<td>.015</td>
<td>.595</td>
</tr>
<tr>
<td>Group</td>
<td>-.262</td>
<td>.285</td>
<td>-.096</td>
</tr>
<tr>
<td>Pre Clarity</td>
<td>.512</td>
<td>.328</td>
<td>.236</td>
</tr>
<tr>
<td>Pre Clarity x Group</td>
<td>-.941*</td>
<td>.454</td>
<td>-.296</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.244</td>
<td>.392</td>
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</table>

*Note. All estimates are provided using Sqrt transformation for Pre Clarity and Post PDS.*

*Note. $B$ = partial regression coefficient; $SE$ $B$ = standard error of $B$; $\beta$ = standardized regression coefficient; $R^2$ = .408 for Step 1 ($p < .01$); $\Delta R^2$ = .009 for Step 2 ($p > .05, ns$); $\Delta R^2$ = .000 for Step 3 ($p = .835, ns$); $\Delta R^2$ = .046 for Step 4 ($p < .05$).*
lower levels of posttraumatic stress symptoms at follow-up after controlling for baseline posttraumatic stress and group. Pre Clarity accounted for 2.6% of the variance in the final model.

Since the results demonstrated a significant interaction between Group and Pre Clarity, suggesting that Pre Clarity scores differentially predict outcome for the EW and control group, further analyses were conducted to examine moderation. The simple slopes of significant two-way interactions were investigated following the guidelines described by O’Conner (1998). To begin, Pre PDS and Pre Clarity were both residualized on Post PDS scores and the necessary variables were entered into a program developed by O’Conner (see https://people.ok.ubc.ca/briocconn/simple/simple.html). The $R^2$ values associated with the interaction effects of Group and Pre Clarity and its associated model were not found to be significant. Specifically, an examination of the standardized coefficients revealed that the main effect was not moderated by a two way Group X Pre Clarity interaction. The simple slope was non-significant for the control group ($B = .26, SE B = .22, \beta = .30, t(54) = 1.37, p = .18, ns$), and the EW group ($B = .21, SE B = .17, \beta = .19, t(54) = 1.10, p = .28, ns$), suggesting that the moderation hypothesis was not supported.

**PILL analyses.**

**PILL analyses with DERS total.** As shown in Table 18, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre PILL, Group, Pre DERS, and the interaction of Pre DERS by Group significantly predicts scores on Post PILL. It is important to mention that estimates provided for Pre DERS, Post DERS, Pre PILL, and Post PILL were generated by using their square root transformed values. In Step 1, Pre PILL scores were found to significantly predict Post PILL scores, $R^2 = .683, F_{(1,58)} = 124.952, p < .01$. This indicates that Pre PILL accounts for approximately 68% of variance in Post PILL scores. In Step
Group did not significantly predict Post PILL scores when controlling for Pre PILL, $\Delta R^2 = .001$, $F_{(1, 57)} = .138$, $p = .712$. This indicates that Group explains less than 1% of the variance in Post PILL scores. In Step 3, Pre DERS did not predict Post PILL scores when controlling for Pre PILL and Group, $\Delta R^2 = .000$, $F_{(1, 56)} = .011$, $p = .917$. This indicates that Pre DERS explains less than 1% of the variance in Post PILL scores. In Step 4, the interaction of Pre DERS by Group was also non-significant, controlling for Pre PILL, Group, and Pre DERS, $\Delta R^2 = .003$, $F_{(1, 55)} = .605$, $p = .440$. Overall, the linear combination of all four predictors explained 68.7% of the variance in Post PILL scores.

Table 18

Summary of Hierarchical Regression Analysis for Predicting Post PILL Scores Using Pre PILL, Group, Pre DERS, and the Pre DERS by Group Interaction in the Model ($N = 60$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$\beta$</th>
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</thead>
<tbody>
<tr>
<td>Step 1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre PILL</td>
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<td>.081</td>
<td>.826</td>
</tr>
<tr>
<td>Intercept</td>
<td>-.020</td>
<td>.346</td>
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</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre PILL</td>
<td>.909**</td>
<td>.082</td>
<td>.826</td>
</tr>
<tr>
<td>Group</td>
<td>-.081</td>
<td>.219</td>
<td>-.028</td>
</tr>
<tr>
<td>Intercept</td>
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<td>.364</td>
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</tr>
<tr>
<td>Step 3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre PILL</td>
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<td>.822</td>
</tr>
<tr>
<td>Group</td>
<td>-.077</td>
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<td>-.026</td>
</tr>
<tr>
<td>Pre DERS</td>
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<td>.009</td>
</tr>
<tr>
<td>Intercept</td>
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<td>.403</td>
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<tr>
<td>Variable</td>
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<td>SE B</td>
<td>β</td>
</tr>
<tr>
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<tr>
<td>Pre PILL</td>
<td>.917**</td>
<td>.096</td>
<td>.833</td>
</tr>
<tr>
<td>Group</td>
<td>-.072</td>
<td>.225</td>
<td>-.025</td>
</tr>
<tr>
<td>Pre DERS</td>
<td>-.061</td>
<td>.133</td>
<td>-.054</td>
</tr>
<tr>
<td>Pre DERS x Group</td>
<td>.135</td>
<td>.173</td>
<td>.083</td>
</tr>
<tr>
<td>Intercept</td>
<td>-.004</td>
<td>.408</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre and Post PILL and Pre DERS.

Note. *p < .05, **p < .01

Note. B = partial regression coefficient; SE B = standard error of B; β = standardized regression coefficient; R² = .683 for Step 1 (p < .01); ΔR² = .001 for Step 2 (p > .05, ns); ΔR² = .000 for Step 3 (p > .05, ns); ΔR² = .003 for Step 4 (p > .05, ns).

Examining the regression coefficients in Step 4, it is evident that Pre PILL scores significantly predict Post PILL scores, such that a one unit decrease in Pre PILL is associated with a .912 unit decrease in Post PILL scores, controlling for all other predictors. Further, being in the EW group was found to predict a decrease of .072 units in Post PILL scores, controlling for all other predictors. This effect, however, was not significant. Results also demonstrated that a one unit decrease in Pre DERS scores is associated with a .061 unit increase in Post PILL scores, controlling for all other predictors. Again, this effect was not found to be significant. Finally, the Pre DERS by Group interaction was found to predict a .135 unit increase in Post PILL scores, controlling for all other predictors. This effect, however, was not significant either. Looking at standardized coefficients, or beta weights, it can be seen that Pre PILL is the most influential predictor of Post PILL scores, followed by the interaction of Pre DERS by Group, Pre DERS, and then Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that after controlling for baseline physical symptom levels and emotion regulation abilities, the
EW group did not demonstrate significantly greater improvements in their physical symptoms in comparison to the control group. Moreover, in regards to the predictive value of emotion regulation abilities at baseline, results did not find any support that those individuals with greater abilities to regulate their emotions at baseline demonstrated lower levels of physical symptoms at follow-up after controlling for baseline levels of physical symptoms and group. Emotion regulation accounted for less than 1% of the variance in the final model. Since the results did not demonstrate a significant interaction between group and baseline emotion regulation abilities, the moderation hypothesis was not confirmed.

Finally, although the EW group did not demonstrate significantly greater improvements in their physical symptoms in comparison to the control group, for exploratory purposes a paired-samples t-test was conducted to evaluate whether participants scores on PILL differed from Pre to Post, regardless of group. The results indicated that the participants scores for the entire sample, regardless of group, significantly decreased from Pre ($M = 18.03, SD = 10.92$) to Post ($M = 15.45, SD = 11.20$), $t(59) = 3.55, p < .01$. These results suggest that participants showed significant improvements in their physical symptoms irrespective of writing condition.

**PILL analyses with DERS subscales.** As already mentioned, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of Pre PILL, Group, (Pre DERS subscale), and the interaction of (the Pre DERS subscale) by Group significantly predicts scores on Post PILL. These analyses were conducted in order to examine whether any of the DERS subscales moderated the effect of treatment. Results of all of the DERS subscale analyses indicated no significant main subscale effects, or any significant group by subscale effects. Specifically, no significant results were found in the final models for Non-Acceptance, Goals, Impulse Control, Awareness, Strategies, or Clarity (all $p$-values $> .05$).
DERS analyses.

**DERS total analyses.** As shown in Table 19, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre DERS and Group significantly predicts scores on Post DERS. It is important to mention that estimates provided for Pre DERS and Post DERS were generated by using their square root transformed values. In Step 1, Pre DERS scores were found to significantly predict Post DERS scores, \( R^2 = .721, \ F(1, 58) = 149.721, \ p < .01. \) This indicates that Pre DERS accounts for approximately 72% of variance in Post DERS scores. In Step 2, Group did not significantly predict Post DERS scores when controlling for Pre DERS, \( \Delta R^2 = .000, F(1, 57) = .020, \ p = .889. \) This indicates that Group explains less than 1% of the variance in Post DERS scores. Overall, the linear combination of both predictors explained 72.1% of the variance in Post DERS scores.

**Table 19**

Summary of Hierarchical Regression Analysis for Predicting Post DERS Scores Using Pre DERS and Group in the Model (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>( B )</th>
<th>( SE \ B )</th>
<th>( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre DERS</td>
<td>(.851^{**})</td>
<td>(.070)</td>
<td>(.849)</td>
</tr>
<tr>
<td>Intercept</td>
<td>(1.125)</td>
<td>(.649)</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre DERS</td>
<td>(.850^{**})</td>
<td>(.071)</td>
<td>(.848)</td>
</tr>
<tr>
<td>Group</td>
<td>(-.026)</td>
<td>(.186)</td>
<td>(-.010)</td>
</tr>
</tbody>
</table>
Examining the regression coefficients in Step 2, it is evident that Pre DERS scores significantly predict Post DERS scores, such that a one unit decrease in Pre DERS is associated with a .850 unit decrease in Post DERS scores, controlling for Group. Further, being in the EW group was found to predict a decrease of .026 units in Post DERS scores, controlling for Pre DERS. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre DERS is the most influential predictor of Post DERS scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group did not demonstrate significantly greater improvements in their abilities to regulate their emotions in comparison to the control group.

Finally, although the EW group did not demonstrate significantly greater improvements in their emotion regulation abilities in comparison to the control group, for exploratory purposes a paired-samples $t$-test was conducted to evaluate whether participants scores on the DERS differed from Pre to Post, regardless of group. The results indicated that the participants scores for the entire sample, regardless of group, significantly decreased from Pre ($M = 87.20$, $SD = 25.13$) to Post ($M = 82.62$, $SD = 24.99$), $t(59) = 2.69$, $p < .01$. These results suggest that participants showed significant improvements in their emotion regulation abilities as a result of taking part in the study irrespective of writing condition.
**DERS subscale analyses.**

*Non-acceptance.* As shown in Table 20, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre Non-Acceptance and Group significantly predicts scores on Post Non-Acceptance. It is important to mention that estimates provided for Post Non-Acceptance were generated by using its square root transformed value. In Step 1, Pre Non-Acceptance scores were found to significantly predict Post Non-Acceptance scores, $R^2 = .579$, $F(1, 58) = 79.761$, $p < .01$. This indicates that Pre Non-Acceptance accounts for approximately 58% of variance in Post Non-Acceptance scores. In Step 2, Group did not significantly predict Post Non-Acceptance scores when controlling for Pre Non-Acceptance, $\Delta R^2 = .000$, $F(1, 57) = .037$, $p = .849$. This indicates that Group explains less than 1% of the variance in Post Non-Acceptance scores. Overall, the linear combination of both predictors explained 57.9% of the variance in Post Non-Acceptance scores.

**Table 20**

*Summary of Hierarchical Regression Analysis for Predicting Post Non-Acceptance Scores Using Pre Non-Acceptance and Group in the Model (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$SE\ B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Non-Acceptance</td>
<td>.107**</td>
<td>.012</td>
<td>.761</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.008</td>
<td>.181</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Non-Acceptance</td>
<td>.106**</td>
<td>.012</td>
<td>.759</td>
</tr>
<tr>
<td>Group</td>
<td>-.025</td>
<td>.133</td>
<td>-.017</td>
</tr>
</tbody>
</table>
Examining the regression coefficients in Step 2, it is evident that Pre Non-Acceptance scores significantly predict Post Non-Acceptance scores, such that a one unit decrease in Pre Non-Acceptance is associated with a .106 unit decrease in Post Non-Acceptance scores, controlling for Group. Further, being in the EW group was found to predict a decrease of .025 units in Post Non-Acceptance scores, controlling for Pre Non-Acceptance. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre Non-Acceptance is the most influential predictor of Post Non-Acceptance scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group did not demonstrate significantly greater improvements in their abilities to accept their emotions in comparison to the control group.

Finally, although the EW group did not demonstrate significantly greater improvements in their abilities to accept their emotions in comparison to the control group, for exploratory purposes a Wilcoxon test was conducted to evaluate whether participants’ scores related to difficulties accepting their emotions differed from Pre to Post, regardless of group. Given the need to account for the non-normal distribution of the untransformed Post Non-Acceptance score, the non-parametric Wilcoxon test was used. The results indicated that the participants scores for the entire sample, regardless of group, significantly decreased from Pre ($M = 14.15,$
SD = 5.51) to Post (M = 12.97, SD = 5.75), p < .05. These results suggest that participants showed significant improvements in their abilities to accept their emotions as a result of taking part in the study irrespective of writing condition.

Goals. As shown in Table 21, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre Goals and Group significantly predicts scores on Post Goals. In Step 1, Pre Goals scores were found to significantly predict Post Goals scores, \( R^2 = .571, F_{(1,58)} = 77.205, p < .01 \). This indicates that Pre Goals accounts for approximately 57% of variance in Post Goals scores. In Step 2, Group did not significantly predict Post Goals scores when controlling for Pre Goals, \( \Delta R^2 = .003, F_{(1,57)} = .334, p = .565 \). This indicates that Group explains less than 1% of the variance in Post Goals scores. Overall, the linear combination of both predictors explained 57.4% of the variance in Post Goals scores.

Table 21

Summary of Hierarchical Regression Analysis for Predicting Post Goals Scores Using Pre Goals and Group in the Model (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Goals</td>
<td>.789**</td>
<td>.090</td>
<td>.756</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.989</td>
<td>1.556</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Goals</td>
<td>.797**</td>
<td>.091</td>
<td>.763</td>
</tr>
<tr>
<td>Group</td>
<td>.504</td>
<td>.872</td>
<td>.051</td>
</tr>
<tr>
<td>Intercept</td>
<td>1.620</td>
<td>1.690</td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01

Note. B = partial regression coefficient; SE B = standard error of B; \( \beta \) = standardized regression coefficient; \( R^2 = .571 \) for Step 1 (p < .01); \( \Delta R^2 = .003 \) for Step 2 (p > .05, ns).
Examining the regression coefficients in Step 2, it is evident that Pre Goals scores significantly predict Post Goals scores, such that a one unit decrease in Pre Goals is associated with a .797 unit decrease in Post Goals scores, controlling for Group. Further, being in the EW group was found to predict an increase of .504 units in Post Goals scores, controlling for Pre Goals. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre Goals is the most influential predictor of Post Goals scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group did not demonstrate significantly greater improvements in their abilities to set goals when distressed in comparison to the control group.

Finally, although the EW group did not demonstrate significantly greater improvements in their abilities to set goals when distressed in comparison to the control group, for exploratory purposes a paired-samples $t$-test was conducted to evaluate whether participants scores on the Goals differed from Pre to Post, regardless of group. The results indicated that the participants scores for the entire sample, regardless of group, significantly decreased from Pre ($M = 16.67, SD = 4.80$) to Post ($M = 15.13, SD = 5.01$), $t(59) = 3.46, p < .05$. These results suggest that participants showed significant improvements in their abilities to set goals when distressed irrespective of writing condition.

**Impulse control.** As shown in Table 22, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre Impulse and Group significantly predicts scores on Post Impulse. It is important to mention that estimates provided for Pre Impulse and Post Impulse were generated by using their square root transformed values. In Step 1, Pre Impulse scores were found to significantly predict Post Impulse scores, $R^2 = .607, F_{(1,58)} =$
89.656, *p < .01. This indicates that Pre Impulse accounts for approximately 61% of variance in Post Impulse scores. In Step 2, Group did not significantly predict Post Impulse scores when controlling for Pre Impulse, ΔR² = .004, F(1, 57) = .524, *p = .472. This indicates that Group explains less than 1% of the variance in Post Impulse scores. Overall, the linear combination of both predictors explained 61.1% of the variance in Post Impulse scores.

**Table 22**

*Summary of Hierarchical Regression Analysis for Predicting Post Impulse Scores Using Pre Impulse and Group in the Model (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Impulse</td>
<td>.741**</td>
<td>.078</td>
<td>.779</td>
</tr>
<tr>
<td>Intercept</td>
<td>.897</td>
<td>.276</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Impulse</td>
<td>.748**</td>
<td>.079</td>
<td>.786</td>
</tr>
<tr>
<td>Group</td>
<td>.086</td>
<td>.118</td>
<td>.060</td>
</tr>
<tr>
<td>Intercept</td>
<td>.835</td>
<td>.290</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre Impulse and Post Impulse.

*Note.* *p < .05, **p < .01

*Note.* B = partial regression coefficient; SE B = standard error of B; β = standardized regression coefficient; R² = .607 for Step 1 (*p < .01); ΔR² = .004 for Step 2 (*p > .05, ns).

Examining the regression coefficients in Step 2, it is evident that Pre Impulse scores significantly predict Post Impulse scores, such that a one unit decrease in Pre Impulse is associated with a .748 unit decrease in Post Impulse scores, controlling for Group. Further, being in the EW group was found to predict an increase of .086 units in Post Impulse scores, controlling for Pre Impulse. This effect, however, was not significant. Looking at standardized
coefficients, or beta weights, it can be seen that Pre Impulse is the most influential predictor of Post Impulse scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group did not demonstrate significantly greater improvements in participant’s level of impulse control when distressed in comparison to the control group.

Finally, although the EW group did not demonstrate significantly greater improvements in levels of impulse control when distressed in comparison to the control group, for exploratory purposes a paired-samples t-test was conducted to evaluate whether participants scores on Impulse Control differed from Pre to Post, regardless of group. The results indicated that the participants scores for the entire sample, regardless of group, did not significantly decrease from Pre $(M = 12.45, SD = 5.54)$ to Post $(M = 12.43, SD = 5.33)$, $t(59) = -.83$, $p = .934$, ns.

Awareness. As shown in Table 23, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre Awareness and Group significantly predicts scores on Post Awareness. In Step 1, Pre Awareness scores were found to significantly predict Post Awareness scores, $R^2 = .580$, $F_{(1, 58)} = 80.097$, $p < .01$. This indicates that Pre Awareness accounts for 58% of variance in Post Awareness scores. In Step 2, Group was marginally predictive (i.e., approaching significance) of Post Awareness scores when controlling for Pre Awareness, $\Delta R^2 = .020$, $F_{(1, 57)} = 2.883$, $p = .095$. This indicates that Group explains 2% of the variance in Post Awareness scores. Overall, the linear combination of both predictors explained 60% of the variance in Post Awareness scores.
Table 23

Summary of Hierarchical Regression Analysis for Predicting Post Awareness Scores Using Pre Awareness and Group in the Model (N = 60)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Awareness</td>
<td>.709**</td>
<td>.079</td>
<td>.762</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.512</td>
<td>1.160</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Awareness</td>
<td>.692**</td>
<td>.079</td>
<td>.743</td>
</tr>
<tr>
<td>Group</td>
<td>-1.285</td>
<td>.757</td>
<td>-.143</td>
</tr>
<tr>
<td>Intercept</td>
<td>4.347</td>
<td>1.243</td>
<td></td>
</tr>
</tbody>
</table>

Note. *p < .05, **p < .01

Note. B = partial regression coefficient; SE B = standard error of B; β = standardized regression coefficient; $R^2 = .580$ for Step 1 ($p < .01$); $\Delta R^2 = .020$ for Step 2 ($p > .05$, ns).

Examining the regression coefficients in Step 2, it is evident that Pre Awareness scores significantly predict Post Awareness scores, such that a one unit decrease in Pre Awareness is associated with a .692 unit decrease in Post Awareness scores, controlling for Group. Further, being in the EW group was found to predict a decrease of 1.285 units in Post Awareness scores, controlling for Pre Awareness. This effect, however, was only approaching significance. Looking at standardized coefficients, or beta weights, it can be seen that Pre Awareness is the most influential predictor of Post Awareness scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group did not demonstrate significantly greater improvements in emotional awareness in comparison to the control group. However, a trend did exist.
Finally, although the EW group did not demonstrate significantly greater improvements in emotional awareness in comparison to the control group, for exploratory purposes a paired-samples\ t-test was conducted to evaluate whether participants scores on Awareness differed from Pre to Post, regardless of group. The results indicated that the participants scores for the entire sample, regardless of group, did not significantly decrease from Pre \( (M = 13.83, SD = 4.84) \) to Post \( (M = 13.32, SD = 4.51) \), \( t(59) = 1.234, p = .222, ns. \)

**Strategies.** As shown in Table 24, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre Strategies and Group significantly predicts scores on Post Strategies. It is important to mention that estimates provided for Pre Strategies and Post Strategies were generated by using their square root transformed values. In Step 1, Pre Strategies scores were found to significantly predict Post Strategies scores, \( R^2 = .635, F(1, 58) = 100.743, p < .01 \). This indicates that Pre Strategies accounts for approximately 64% of variance in Post Strategies scores. In Step 2, Group did not significantly predict Post Strategies scores when controlling for Pre Strategies, \( \Delta R^2 = .001, F(1, 57) = .226, p = .636 \). This indicates that Group explains less than 1% of the variance in Post Strategies scores. Overall, the linear combination of both predictors explained 63.6% of the variance in Post Strategies scores.

**Table 24**

**Summary of Hierarchical Regression Analysis for Predicting Post Strategies Scores Using Pre Strategies and Group in the Model (N = 60)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>( B )</th>
<th>( SE B )</th>
<th>( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Strategies</td>
<td>.802**</td>
<td>.080</td>
<td>.797</td>
</tr>
<tr>
<td>Intercept</td>
<td>.679</td>
<td>.347</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Examinining the regression coefficients in Step 2, it is evident that Pre Strategies scores significantly predict Post Strategies scores, such that a one unit decrease in Pre Strategies is associated with a .807 unit decrease in Post Strategies scores, controlling for Group. Further, being in the EW group was found to predict an increase of .062 units in Post Strategies scores, controlling for Pre Strategies. This effect, however, was not significant. Looking at standardized coefficients, or beta weights, it can be seen that Pre Strategies is the most influential predictor of Post Strategies scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group did not demonstrate significantly greater improvements in their abilities use emotion regulation strategies when distressed in comparison to the control group.

Finally, although the EW group did not demonstrate significantly greater improvements in their abilities to use emotion regulation strategies when distressed in comparison to the control group, for exploratory purposes a paired-samples t-test was conducted to evaluate whether participants scores on Strategies differed from Pre to Post, regardless of group. The results indicated that the participants scores for the entire sample, regardless of group, significantly decreased from Pre \((M = 18.85, SD = 7.20)\) to Post \((M = 17.47, SD = 7.05)\), \(t(59) = 2.510, p < \)
These results suggest that participants showed significant improvements in their abilities to use emotion regulation strategies when distressed irrespective of writing condition.

**Clarity.** As shown in Table 25, a hierarchical multiple regression was conducted to examine whether the linear combination of Pre Clarity and Group significantly predicts scores on Post Clarity. It is important to mention that estimates provided for Pre Clarity and Post Clarity were generated by using their square root transformed values. In Step 1, Pre Clarity scores were found to significantly predict Post Clarity scores, $R^2 = .482$, $F(1, 58) = 53.916$, $p < .01$. This indicates that Pre Clarity accounts for approximately 48% of variance in Post Clarity scores. In Step 2, Group significantly predicted Post Clarity scores when controlling for Pre Clarity, $\Delta R^2 = .040$, $F(1, 57) = 4.743$, $p < .05$. This indicates that Group explains 4% of the variance in Post Clarity scores. Overall, the linear combination of both predictors explained 52.2% of the variance in Post Clarity scores.

**Table 25**

*Summary of Hierarchical Regression Analysis for Predicting Post Clarity Scores Using Pre Clarity and Group in the Model (N = 60)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Clarity</td>
<td>.742**</td>
<td>.101</td>
<td>.694</td>
</tr>
<tr>
<td>Intercept</td>
<td>.822</td>
<td>.339</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Clarity</td>
<td>.729**</td>
<td>.098</td>
<td>.682</td>
</tr>
<tr>
<td>Group</td>
<td>-.262*</td>
<td>.121</td>
<td>-.200</td>
</tr>
<tr>
<td>Variable</td>
<td>$B$</td>
<td>$SE,B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Intercept</td>
<td>.988</td>
<td>.338</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre Clarity and Post Clarity.

Note. *$p < .05$, **$p < .01$*

Note. $B =$ partial regression coefficient; $SE\,B =$ standard error of $B$; $\beta =$ standardized regression coefficient; $R^2 = .482$ for Step 1 ($p < .01$); $\Delta R^2 = .040$ for Step 2 ($p < .05$).

Examining the regression coefficients in Step 2, it is evident that Pre Clarity scores significantly predict Post Clarity scores, such that a one unit decrease in Pre Clarity is associated with a .729 unit decrease in Post Clarity scores, controlling for Group. Further, being in the EW group was found to significantly predict a decrease of .262 units in Post Clarity scores, controlling for Pre Clarity. Looking at standardized coefficients, or beta weights, it can be seen that Pre Clarity is the most influential predictor of Post Clarity scores followed by Group.

With regards to the effectiveness of the two writing conditions, these findings suggest that the EW group demonstrated significantly greater improvements in their levels of emotional clarity in comparison to the control group.

**Additional Exploratory Analyses Considering Arousal as a Moderator**

**Post-hoc data analysis plan and predictions.** It was decided post-hoc to examine:

1. whether the EW group and the control group significantly differed in their level of arousal across the three writing sessions, and
2. whether any of the groups demonstrated significant decreases in physiological arousal from Time 1 to Time 3.

Based on previous research conducted by Sloan and her colleagues (2007), it was expected that the EW and control group would differ in arousal initially, with the EW group demonstrating
greater arousal, but that these differences would diminish across writing sessions. Additionally, it was expected that the EW group would demonstrate a significant decrease in physiological arousal from Time 1 to Time 3, while the control group would not. Regardless of the results of these analyses, post hoc exploratory analyses were also conducted in order to test the moderating effects of the change in physiological arousal from T1 to T3. In order to do so, an arousal change score variable was created. Then, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of Pre Outcome Measure (for each of BDI-II, PDS, PILL, DERS Total, and six DERS subscales), Group, Arousal Change Score, and the interaction of Arousal Change Scores by Group significantly predicted scores on Post Outcome Measures (for each of BDI-II, PDS, PILL, DERS Total, and six DERS subscales).

**Group differences in arousal levels across writing sessions.** In order to answer the first question, three separate independent samples $t$-tests were performed using group (EW versus control) as the independent variable and arousal (Time 1, Time 2, and Time 3) as the dependent variables. The results indicated that scores on levels of arousal at Time 1 were significantly different between groups, $t(58) = -2.856, p < .01$, with those in the EW group ($M = 4.36, SD = 1.97$) demonstrating greater arousal in comparison to the control group ($M = 5.84, SD = 2.05$). Additionally, the results indicated that scores on levels of arousal at Time 2 were also significantly different between groups, $t(57) = -2.242, p < .05$, with those in the EW group ($M = 4.86, SD = 2.16$) demonstrating greater arousal in comparison to the control group ($M = 6.07, SD = 1.98$). However, the results indicated that scores on levels of arousal at Time 3 were not significantly different between groups, $t(57) = 1.363, p = .178, ns$, with those in the EW group ($M = 6.25, SD = 2.07$) demonstrating similar arousal levels to that of the control group ($M = 5.84, SD = 2.23$).
Changes in arousal levels across writing sessions. In order to answer the second question, two separate paired-samples t-tests (for the EW group and the control group) were conducted to evaluate whether participants’ scores on arousal differed from Time 1 to Time 3. The results indicated that for the EW group, arousal levels significantly decreased from Time 1 ($M = 4.36, SD = 1.97$) to Time 3 ($M = 6.25, SD = 2.07$), $t(27) = -3.274, p < .01$. However, no such difference was found for the control group on arousal ratings from Time 1 ($M = 5.84, SD = 2.05$) to Time 3 ($M = 5.48, SD = 2.23$), $t(30) = .845, p = .405, ns$.

Taken together, these results suggest that although the EW participants initially demonstrated higher levels of arousal to their writing at Time 1 and Time 2, by the third writing session their levels of arousal had significantly decreased to a level that was comparable to the control group.

Arousal change scores as a moderating variable. In order to test moderating effects of the change in physiological arousal, a series of hierarchical multiple regressions were conducted to examine whether the linear combination of Pre Outcome Measure (for each of BDI-II, PDS, PILL, DERS Total and six DERS subscales), Group, Arousal Change Score, and the interaction of Arousal Change Scores by Group significantly predicts scores on Post Outcome Measures (for each of BDI-II, PDS, PILL, DERS Total and DERS subscales). Results of the separately conducted analyses indicated no significant main effect for arousal change scores or any significant group by arousal effects for any of the outcome measures (all $p$-values > .05, $ns$).

Testing the Effects of Emotion Regulation as a Mediator in EW

DERS total change score as the mediator. To investigate the mediation hypothesis, a mediation analysis following the approach outlined by Baron and Kenny (1986) was conducted.
Specifically, in order for a mediation to take place, a number of multiple regressions were conducted to determine if the following conditions were met:

1. The predictor variable X (i.e., baseline outcome measure) was significantly correlated with the criterion variable Y (i.e., follow-up outcome measure).

2. The predictor variable X (i.e., baseline outcome measure) was significantly correlated with the mediating variable M (i.e., emotion regulation change score).

3. The mediating variable M (i.e., emotion regulation change score) was significantly correlated with the criterion variable Y (i.e., follow-up outcome measure) when controlling for the predictor variable X (i.e., baseline outcome measure).

4. For a full mediation to exist, the effect of the predictor variable X (i.e., baseline outcome measure) on the criterion variable Y (i.e., follow-up outcome measure), controlling for the mediating variable M (i.e., emotion regulation change score), should be 0. If a partial mediation exists, the Sobel test would be performed via the use of an online calculator to determine significance.

Given the hypothesis for the current study predicted that mediation will exist for the EW group but not the control group, these analyses were conducted separately for each group. In order to obtain the mediating variable M (i.e., an emotion regulation change score), the Pre DERS was subtracted from the Post DERS. This initial change score variable was found to be negatively skewed. In order to conduct a SQRT transformation on this variable, it was necessary for it to be positively skewed in order to ensure an accurate transformation. Additionally, due to the existence of negative values (minimum= -47, maximum= 20), a constant of 48 was added to every change score value to ensure only positive numbers, so as to allow a SQRT transformation.
Before running this transformation, this value was reversed by subtracting 69 from each value. Once transformed, the change score variable was centered around the value 4.58, which corresponded to “no change”. This resulted once again in a value of 0 indicating no change in emotion regulation scores, negative scores indicating a decrease in abilities to regulate emotions, and positive scores indicating an increase in abilities to regulate emotions.

As can be seen in Tables 26 and 27, the mediation hypothesis was not supported for any of the outcome variables. Specifically, for the mediation analysis for the EW group pertaining to the PDS, for step one the predictor variable Pre PDS was not significantly correlated with the criterion Post PDS. As a result, steps two and three were not performed. For all other variables, for both the EW group and the control group analyses, although step one was satisfied (i.e., all correlations significant), step two was not. Specifically, the predictor variable X (i.e., baseline outcome measure) was not significantly correlated with the mediating variable emotion regulation change score for any of the analyses. As a result, step three analyses were not performed and no support for the mediation hypothesis was found.

Table 26

**Summary of Mediation Analyses for EW Group Using DERS Total Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th></th>
<th>Step 2</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
<td>M→Y: B(SE)</td>
<td>Sobel test</td>
<td></td>
</tr>
<tr>
<td>BDI-II</td>
<td>.635**(.153)</td>
<td>-.087 (.202)</td>
<td></td>
<td></td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td></td>
<td></td>
<td></td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td>Step 1</td>
<td>Step 2</td>
<td>Step 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
<td>M→Y: B(SE)</td>
<td>Sobel test</td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.934**(.144)</td>
<td>.274(.224)</td>
<td>Not performed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, Post PDS, and DERS Change Score.

*Note.* *p < .05, **p < .01

**Table 27**

**Summary of Mediation Analyses for Control Group Using DERS Total Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.907**(.135)</td>
<td>-.039 (.197)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.099**(.015)</td>
<td>-.003(.024)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.898**(.102)</td>
<td>-.007(.170)</td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, Post PDS, and DERS Change Score.

*Note.* *p < .05, **p < .01

**DERS subscale change scores as the mediator.** To investigate the mediation hypothesis further, a series of mediation analyses following the approach outlined by Baron and Kenny (1986) were conducted using each of the DERS subscale change scores as the mediation variable as opposed to the DERS total change score. All DERS subscale change scores were found to be normally distributed and no transformations were required. As can be seen in Tables 28 through 39, no support for the mediation hypothesis was found when using each of the six DERS subscales as the mediating variable. Specifically, for the mediation analysis for the EW group...
pertaining to the PDS, for step one the predictor variable Pre PDS was not significantly correlated with the criterion Post PDS. As a result, steps two and three were not performed.

**Table 28**

*Summary of Mediation Analyses for EW Group Using Non-Acceptance Change Score*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.635**(.153)</td>
<td>.396 (.504)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.934**(.144)</td>
<td>-.699(.557)</td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01

**Table 29**

*Summary of Mediation Analyses for Control Group Using Non-Acceptance Change Score*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.907**(.135)</td>
<td>.442 (.590)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.099**(.015)</td>
<td>.039(.072)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.898**(.102)</td>
<td>.241(.512)</td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01
### Table 30

**Summary of Mediation Analyses for EW Group Using Goals Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>X→Y: B(SE)</th>
<th>X→M: B(SE)</th>
<th>X→Y: B(SE)</th>
<th>M→Y: B(SE)</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI-II</td>
<td>.635** (.153)</td>
<td>.865 (.559)</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td>Not performed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.934** (.144)</td>
<td>-.823 (.605)</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01

### Table 31

**Summary of Mediation Analyses for Control Group Using Goals Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>X→Y: B(SE)</th>
<th>X→M: B(SE)</th>
<th>X→Y: B(SE)</th>
<th>M→Y: B(SE)</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI-II</td>
<td>.907** (.135)</td>
<td>-.349 (.458)</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>.099** (.015)</td>
<td>-.081 (.056)</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.898** (.102)</td>
<td>-.045 (.399)</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01
### Table 32

*Summary of Mediation Analyses for EW Group Using Impulse Control Change Score*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(X \rightarrow Y: B(SE))</td>
<td>(X \rightarrow M: B(SE))</td>
<td>(X \rightarrow Y: B(SE))</td>
<td>(M \rightarrow Y: B(SE))</td>
</tr>
<tr>
<td>BDI-II</td>
<td>(.635^{**}(.153))</td>
<td>(.540 (.202))</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>(.059 (.030))</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>(.934^{**}(.144))</td>
<td>(-1.370^*(.525))</td>
<td>(.981^{**}(.164))</td>
<td>(.034(.055))</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* \(^* p < .05, \^{**} p < .01\)

### Table 33

*Summary of Mediation Analyses for Control Group Using Impulse Control Change Score*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(X \rightarrow Y: B(SE))</td>
<td>(X \rightarrow M: B(SE))</td>
<td>(X \rightarrow Y: B(SE))</td>
<td>(M \rightarrow Y: B(SE))</td>
</tr>
<tr>
<td>BDI-II</td>
<td>(.907^{**}(.135))</td>
<td>(.255 (.520))</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>(.099^{**}(.015))</td>
<td>(-.011(.064))</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>(.898^{**}(.102))</td>
<td>(-.215(.448))</td>
<td>Not performed</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* \(^* p < .05, \^{**} p < .01\)
### Table 34

**Summary of Mediation Analyses for EW Group Using Awareness Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$X \rightarrow Y$: B(SE)</td>
<td>$X \rightarrow M$: B(SE)</td>
<td>$X \rightarrow Y$: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.635**(.153)</td>
<td>-.344 (.486)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.934**(.144)</td>
<td>.042(.543)</td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01

### Table 35

**Summary of Mediation Analyses for Control Group Using Awareness Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$X \rightarrow Y$: B(SE)</td>
<td>$X \rightarrow M$: B(SE)</td>
<td>$X \rightarrow Y$: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.907**(.135)</td>
<td>-.267 (.464)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.099**(.015)</td>
<td>.068(.056)</td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.898**(.102)</td>
<td>-.283(.399)</td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01
Table 36

**Summary of Mediation Analyses for EW Group Using Strategies Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
<td>M→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.635**(.153)</td>
<td>.250 (.677)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td></td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.934**(.144)</td>
<td>.357(.628)</td>
<td></td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01

Table 37

**Summary of Mediation Analyses for Control Group Using Strategies Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
<td>M→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.907**(.135)</td>
<td>-.335 (.685)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.099**(.015)</td>
<td>-.012(.086)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.898**(.102)</td>
<td>.226(.591)</td>
<td></td>
<td>Not performed</td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01
### Table 38

**Summary of Mediation Analyses for EW Group Using Clarity Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$X \rightarrow Y$: B(SE)</td>
<td>$X \rightarrow M$: B(SE)</td>
<td>$X \rightarrow Y$: B(SE)</td>
<td>$M \rightarrow Y$: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.635** (.153)</td>
<td>-.613 (.577)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td>.047 (.052)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.934** (.144)</td>
<td>.274 (.224)</td>
<td>Not performed</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01

### Table 39

**Summary of Mediation Analyses for Control Group Using Clarity Change Score**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$X \rightarrow Y$: B(SE)</td>
<td>$X \rightarrow M$: B(SE)</td>
<td>$X \rightarrow Y$: B(SE)</td>
<td>$M \rightarrow Y$: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.907** (.135)</td>
<td>.119 (.427)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PDS</td>
<td>.099** (.015)</td>
<td>.047 (.052)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.898** (.102)</td>
<td>-.216 (.366)</td>
<td>Not performed</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* All estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, and Post PDS.

*Note.* *p < .05, **p < .01
In regards to the Impulse Control mediation analysis for the EW group pertaining to the PILL, the predictor variable Pre PILL was significantly correlated with the criterion variable Post PILL (i.e., step 1 was satisfied). Additionally, step 2 was satisfied as the predictor variable Pre PILL was significantly correlated to the mediating variable Impulse Control change score. However, step 3 was not satisfied given the mediating variable Impulse Control change score was not significantly correlated to the criterion variable Post PILL.

For all other variables, for both the EW group and the control group analyses, although step one was satisfied (i.e., all correlations significant), step two was not. Specifically, the predictor variable X (i.e., baseline outcome measure) was not significantly correlated with the mediating variable emotion regulation change score for any of analyses. As a result, step three analyses were not performed. Overall, these results provide no support for the mediation hypothesis.

**Additional Exploratory Analyses Considering Arousal as a Mediator**

**Post hoc data analysis plan.** It was decided post-hoc to examine whether decreases in physiological arousal from Time 1 to Time 3 (i.e., arousal change score) acted as a potential mediating variable. In order to test this, a mediation analysis following the approach outlined by Baron and Kenny (1986) was conducted using the arousal change score as the mediation variable. The arousal change score was found to be normally distributed and no transformation was required.

**Arousal change scores as a mediating variable.** As can be seen in Tables 40 and 41, no support for the mediation hypothesis was found when testing arousal as the mediating variable. Specifically, for the mediation analysis for the EW group pertaining to the PDS, for step one the
predictor variable Pre PDS was not significantly correlated with the criterion Post PDS. As a result, steps two and three were not performed.

**Table 40**

*Summary of Mediation Analyses for EW Group Using Arousal Change Score*

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
<td>M→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.635**(.153)</td>
<td>1.117*(.435)</td>
<td>.687**(.174)</td>
<td>-.046(.071)</td>
</tr>
<tr>
<td>PDS</td>
<td>.059 (.030)</td>
<td>Not performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PILL</td>
<td>.934**(.144)</td>
<td>.483(.531)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>DERS</td>
<td>.823**(.102)</td>
<td>.382(.444)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>NonAcceptance</td>
<td>.108**(.016)</td>
<td>.078(.111)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>.773**(.132)</td>
<td>.096(.119)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>Impulse Control</td>
<td>.792**(.098)</td>
<td>.867(.762)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>Awareness</td>
<td>.689**(.111)</td>
<td>.059(.125)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>Strategies</td>
<td>.896**(.113)</td>
<td>.241(.726)</td>
<td>Not performed</td>
<td></td>
</tr>
<tr>
<td>Clarity</td>
<td>.702**(.153)</td>
<td>.443(.963)</td>
<td>Not performed</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, Post PDS Pre DERS, Post DERS, Post DERS NonAcceptance, Pre DERS ImpulseControl, Post DERS Impulse Control, Pre DERS Strategies, Post DERS Strategies, Pre DERS Clarity, and Post DERS Clarity.

*Note.* *p < .05, **p < .01
Table 41
Summary of Mediation Analyses for Control Group Using Arousal Change Score

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Sobel test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X→Y: B(SE)</td>
<td>X→M: B(SE)</td>
<td>X→Y: B(SE)</td>
<td>M→Y: B(SE)</td>
</tr>
<tr>
<td>BDI-II</td>
<td>.907**(.135)</td>
<td>.336 (.358)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PDS</td>
<td>.099**(.015)</td>
<td>.003(.044)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>PILL</td>
<td>.898**(.102)</td>
<td>.021(.305)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>DERS</td>
<td>.874**(.100)</td>
<td>.245(.361)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>NonAcceptance</td>
<td>.105**(.018)</td>
<td>.047(.082)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>Goals</td>
<td>.821**(.128)</td>
<td>-.008(.104)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>Impulse Control</td>
<td>.706**(.123)</td>
<td>.065(.648)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>Awareness</td>
<td>.694**(.113)</td>
<td>.083(.096)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>Strategies</td>
<td>.721**(.116)</td>
<td>.305(.595)</td>
<td></td>
<td>Not performed</td>
</tr>
<tr>
<td>Clarity</td>
<td>.753**(.128)</td>
<td>1.229(.715)</td>
<td></td>
<td>Not performed</td>
</tr>
</tbody>
</table>

Note. Estimates are provided using Sqrt transformation for Pre BDI-II, Post BDI-II, Pre PILL, Post PILL, Post PDS Pre DERS, Post DERS, Post DERS NonAcceptance, Pre DERS ImpulseControl, Post DERS Impulse Control, Pre DERS Strategies, Post DERS Strategies, Pre DERS Clarity, and Post DERS Clarity.

Note. *p < .05, **p < .01

In regards to the arousal mediation analysis for the EW group pertaining to the BDI-II, the predictor variable Pre BDI-II was significantly correlated with the criterion variable Post BDI-II (i.e., step 1 was satisfied). Additionally, step 2 was satisfied as the predictor variable Pre BDI-II was significantly correlated to the mediating variable arousal change score. However,
step 3 was not satisfied given the mediating variable arousal change score was not significantly correlated to the criterion variable Post BDI-II.

For all other variables, for both the EW group and the control group analyses, although step one was satisfied (i.e., all correlations significant), step two was not. Specifically, the predictor variable X (i.e., baseline outcome measure) was not significantly correlated with the mediating variable arousal change score for any of analyses. As a result, step three analyses were not performed. Overall, these results provide no support for the mediation hypothesis.
Chapter 4:
Discussion

Hypothesis 1: Effectiveness of EW versus Control

Our first prediction was that participants assigned to the EW condition would demonstrate significantly greater improvements from baseline to follow-up on psychological (i.e., BDI-II and PDS total scores) and physical (i.e., PILLL total score) health outcome measures, as well as in their abilities to regulate their emotions (i.e., DERS total score and DERS subscales), in comparison to those in the control condition.

The results of the current study partially supported our first hypothesis. Specifically, it was found that in comparison to the control group, participants assigned to the EW group demonstrated greater improvements in depressive symptomatology at 1-month follow-up. This finding is consistent with previous studies that have concluded that EW leads to greater benefits in depressive symptoms for both non-clinical (Epstein et al., 2005; Sloan et al., 2007; Smyth et al., 2008) and clinical samples (Frisina et al., 2004).

It was also found that EW participants reported greater clarity about their emotional experience at 1-month follow-up in comparison to the control group. Moreover, a trend emerged whereby the EW group demonstrated greater improvements at 1-month follow-up over the control group in their awareness of their emotional experience. These findings support the model of emotional expression put forth by Kennedy-Moore and Watson (1999), as well as the model of emotion regulation posited by Watson and her colleagues (Elliot et al., 2004; Greenberg, 2002, 2004; Greenberg & Paivio, 1997; Kennedy-Moore & Watson, 1999). Given that EW is a form of emotional expression, which provides clients with the opportunity to confront and reflect
on their emotional experience, it is to be expected that participants who successfully and productively express their deepest thoughts and emotions related to their traumatic event would become more aware of their emotions and gain insight into and clarity about them as well. In addition to supporting the theoretical model of emotion expression and emotion regulation, these findings are also consistent with other theories posited in the EW literature suggesting that EW is effective because it increases self-understanding or insight into a problem or past traumatic event (Pennebaker, 1993a, 1993b; Pennebaker & Francis, 1996) and facilitates the formation of a narrative which strengthens cognitive-emotional integration and leads to meaning creation (Park & Blumberg, 2002; Pennebaker & Seagal, 1999; Smyth et al., 2001).

Although no other significant between-group differences emerged, results suggested that all participants, regardless of group, demonstrated significant improvements in their symptoms at 1-month follow-up on measures of posttraumatic stress, physical health, and overall emotion regulation abilities. Examination of the various emotion regulation subscales indicated that all participants, regardless of group, demonstrated significant improvements in their ability to accept their emotions, engage in goal directed behaviour when experiencing negative emotions, and access emotion regulation strategies they perceived as effective. Taken together, these findings suggest that participants demonstrated improvements in a number of psychological and physical health outcomes as a result of writing; although, the topic or manner in which they wrote did not appear to matter. In contrast, participants did not demonstrate significant improvements at 1-month follow-up in their ability to control their impulsive behaviour when experiencing negative emotions. This finding is consistent with previous research that suggests EW does not lead to improvements in health behaviours related to impulsivity such as alcohol use, drug use, sleeping habits, and eating habits (Smyth, 1998).
Given that previous research has repeatedly demonstrated that control participants have improved as much as, or even more than EW participants on measures of psychological and physical health (Mackenzie, Wiprzycka, Hasher, & Goldstein, 2007), it is prudent to review reasons why this may have occurred in the current study. The null findings could be interpreted as suggesting three separate hypotheses. First, these results could suggest that EW was not effective. Second, the results could indicate that EW is effective, but that the control writing is also effective. Third, these results may suggest that EW was effective but that we were unable to detect its effect. The first two explanations will be reviewed now and the third explanation will be addressed at the end of this paper in the context of limitations and future directions.

Although we found significant group differences in favour of the EW group for depression and clarity, as well as a trend for increased awareness, one possible reason why no group differences were found on the other outcomes measures is simply because no differences exist. This view has been espoused by a number of researchers. For instance, a meta-analysis by Harris (2006) demonstrated that although EW resulted in greater decreases in health care utilization for “healthy” participants in comparison to controls, the same result was not found for participants screened for medical problems or psychological distress. Therefore, the fact that participants in the current study were screened for current distress related to their traumatic event suggests that EW may not have been as effective as it would have been had we recruited “healthy” participants who did not endorse any ongoing distress upon entering the study.

Similarly, a meta-analysis by Mogk and colleagues (2006) demonstrated that although EW led to minimal improvements for health-related behaviours in comparison to control writing participants, no significant findings emerged to suggest that EW results in significant long-term improvements in psychological and physical health outcomes. Mogk and colleagues concluded
from their analysis that EW is not a useful intervention and suggest abandoning attempts to use it as a therapeutic intervention.

Others have been less definitive in their conclusions and have suggested that a number of participant and methodological variables are important to consider when making conclusions about the effectiveness of the EW intervention. Given the efforts made in the current study to closely resemble the methodology and recruitment procedures used by Sloan and her colleagues (Epstein et al., 2005; Sloan & Marx, 2004a; Sloan et al., 2005; Sloan et al., 2007), who have repeatedly found significant group differences on measures of psychological and physical health, it is important to highlight three differences between our study and theirs in order to further explain our null findings. First, it is possible that EW was not effective for our sample given that our recruitment efforts tended to focus on a community sample as opposed to a college student sample. Previous research has demonstrated that student samples receive significantly greater benefits from EW in comparison to other samples from the community (Smyth, 1998). It is quite possible that we did not find group differences on many outcome measures because no differences exist on these measures when utilizing an EW intervention with a community sample like ours. Despite this argument, existing research suggests that EW is effective for both non-clinical (Smyth, 1998) and clinical samples (Frisina et al., 2004). Additionally, more recent meta-analytic research has demonstrated that studies making use of community samples result in greater psychological benefits in comparison to studies utilizing college student samples (Frattaroli, 2006); therefore, it is unlikely that this explanation fully accounted for the null findings.

A second difference between our study and the collection of studies by Sloan and her colleagues has to do with the average age of our participants. Specifically, the average age of
participants in the current study was 30.52 years \((SD = 11.37)\), which is much higher than those found in studies conducted by Sloan and her colleagues (Epstein et al., 2005; Sloan & Marx, 2004a; Sloan et al., 2007). For instance, a review of Sloan and colleagues’ studies suggest a mean age of 18.7 years \((SD = 1.1)\); Sloan et al., 2007), 18.9 years \((SD = 2.9)\); Sloan & Marx, 2004a) and 20.9 years \((SD = 4.8)\); Epstein et al., 2005). It is possible that EW is not as effective for older individuals and that this was one of the reasons why few group differences emerged in our current study. Research has suggested that as people age they make use of different emotion regulation strategies, such that older individuals attempt to selectively attend to positive information (Cartensen, Mikels, & Mather, 2006). Given the EW instructions requested participants to write about a traumatic experience that continued to cause them distress, being able to focus on positive aspects of the trauma may not have been a viable option for EW participants. This argument has also been put forth by Mackenzie and colleagues (2007) who failed to find group differences between EW and control writing with an older aged sample \((M = 61.53; SD = 12.83)\). In fact, Mackenzie and colleagues found that the control group improved more than the EW group at follow-up on a measure of psychological health. Future EW studies utilizing an older population could test this empirically by adding a third writing group which directs participants to write about positive aspects of their trauma. This would be similar to studies by King and colleagues (King, 2001; King & Miner, 2000), who up to this point have only done so with college aged participants.

A third difference between our study and the studies by Sloan and her colleagues which may explain some of the null findings is the fact that 70% of our participants were women. Previous research has suggested that EW is more effective for men (Smyth, 1998), and thus the possibility exists that more significant findings would have emerged had there been a greater
proportion of men recruited. However, although this is a possibility, subsequent meta-analyses
have not supported this claim, and have instead concluded that there are no significant gender
differences for outcome in EW studies (Frisina et al., 2004; Frattaroli, 2006). Regardless, recent
studies conducted by Sloan and her colleagues have commonly assigned participants to groups
based on equal gender assignment and have repeatedly demonstrated significant findings. As a
result, future studies could make an effort to ensure groups are gender balanced during the
recruitment phase of the study just in case gender does in fact have an impact on the benefits
obtained.

If it is to be argued that EW is not effective, then how does one go about explaining the
significant improvements that were found on many of the outcome measures in the current
study? One explanation is regression to the mean, which suggests that people with high scores
will demonstrate improvements over time in their psychological and physical health due to
perhaps, a natural course of recovery. If this is indeed true, it would suggest that improvements
observed for either group are not the result of writing emotionally about their trauma or
unemotionally about how they spend their time, but rather that these changes reflect an effect of
time. This argument has been alluded to by others in the EW literature to explain null findings
(Mackenzie et al., 2007). Future studies could test this by incorporating a waitlist control group
and comparing this group to both EW and control writing groups to clarify this issue.

A second explanation that addresses this issue involves the manner in which participants
were recruited for the current study. In contrast to previous recruitment strategies by Sloan and
her colleagues, where participants were asked to write about stories related to their lives (Epstein
et al., 2005; Sloan & Epstein, 2005; Sloan et al., 2007), the current study recruited participants
by informing them that we were examining the potential benefits that writing has on recovery
from trauma. It is quite possible that this decision promoted a heightened expectation for both groups that their involvement in the study would lead to improvements in their psychological and physical health. This is congruent with findings from the psychotherapy literature (Meyer et al., 2002) as well as the EW literature (Langens & Schuler, 2007), which suggest that greater expectancies lead to greater improvements in psychological and physical health outcomes. Perhaps future EW studies could be mindful not to recruit participants in this manner in order to decrease the possible confounding effects that positive expectancies introduce.

A final explanation involves the possibility that improvements resulted from the process of being screened and completing questionnaires. More specifically, it is plausible that our screening procedures and psychological questionnaires required participants to confront and reflect on their traumatic memory and associated emotional distress and that the act of writing about their emotions or how they spend their time resulted in no added benefits. This was evident when reviewing our open-ended question which allowed participants to indicate why they thought that the writing was or was not helpful in dealing with their trauma. For instance, one participant wrote “Writing, regardless of what I actually wrote, forced an awareness of the issue for me. When I realized how negative and upset I was, it made me realize how bad I had gotten. It forced me to take time to focus solely on my own adaptation to the trauma”. Further evidence in support of this claim comes from Rubin, Boals, and Klein (2010). Recently, this group has demonstrated that improvements in psychological health have resulted by having participants complete questionnaires related to the traumatic memory. Rubin and colleagues posit that “it could be that expressive writing functions by changing the memory but that the task of reinstating a memory and thinking about it in the ways required to answer our extensive set of ratings, or perhaps just some subset of them, has a similar effect to expressive writing. Thus once
participants answer our questionnaires about the memory, expressive writing would add little more change” (p. 43). Although more evidence is needed to support this claim, it is possible that the EW and control participants in our current study demonstrated similar improvements on measures of psychological and physical health as a result of the increased attention directed towards their trauma and associated distress while completing our screening procedure and questionnaires.

As already mentioned, a second interpretation of the findings from the current study is that in addition to EW being effective, it is possible that the control group leads to benefits through its own mechanism of action and is also effective. This has been suggested recently by Mackenzie and colleagues (2007) who demonstrated that their control group actually demonstrated greater improvements on psychological health outcome measures for a group of caregivers of older adults who were physically frail and cognitively impaired. A number of mechanisms of action exist which could account for why the control group demonstrated significant improvements in the current study.

First, MacKenzie and colleagues (2007) have suggested that EW may be akin to an emotion focused intervention, while the time management control condition could be viewed as a problem focused intervention. According to Lazarus and his colleagues (Folkman & Lazarus, 1985; Lazarus, 1991; Lazarus & Folkman, 1984), emotion focused coping involves efforts to regulate emotional distress while problem focused coping involves acquiring information, devising a plan, and initiating action. Although it can be argued that both coping strategies can lead to improvements in psychological distress (Folkman & Lazarus, 1980; 1985; Lazarus, 1993), a recent meta-analysis suggests that emotion focused coping strategies are less effective than problem focused coping strategies (Penley, Tomaka, & Wiebe, 2002). It is plausible then
that if the time management control writing condition facilitates problem focused coping, the writing instructions may have allowed participants to view their psychological distress and current life situation in a more manageable manner and encouraged problem solving action tendencies. As already mentioned, this view has also recently been espoused by Mackenzie and colleagues (2007). A quote from a participant’s description of why the control writing was helpful suggests that this may indeed be the case for some participants, as the participant wrote “The writing helped me accept certain things I was having a problem with, and made me think I should address some issues”.

A second possible mechanism of action for the control writing group relates to goal setting theory which emerged from the field of industrial organizational psychology (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). According to Morisano and colleagues (2010), “setting goals can markedly improve performance at any given task” (p. 256). Moreover, they argue that goal setting allows for greater self-regulation when selecting between engaging in goal-relevant versus goal-irrelevant courses of action, and can lead to increased enthusiasm and persistence which buffers an individual from the deleterious effects of anxiety, frustration, and disappointment. It is quite possible that one of the mechanisms of action for the time management control group in our study was that of goal setting. By requesting participants to describe what they planned to do in the upcoming week (writing session three), we may have facilitated improvements in psychological and physical health. This was evident when reviewing our open-ended question which allowed participants to indicate why they thought that the writing was or was not helpful in dealing with their trauma. For instance, one participant wrote “It made me pay attention to what was going on right now. That helped me move forward on projects and activities that matter to me and I feel depressed less and less often now”. Further support for this
comes from a recent study by Morisano and her colleagues which demonstrated that in comparison to a control writing group, students that completed a goal-setting exercise experienced greater improvements in negative affect and their college GPA, and demonstrated a higher likelihood of maintaining a full course load.

A third possible mechanism of action for our control writing group has to do with participants realizing that they are functioning quite well despite having experienced a traumatic event. This was evident when reviewing our open-ended question which allowed participants to indicate why they thought that the writing was or was not helpful in dealing with their trauma. For instance, one participant wrote “I think my writing was helpful in dealing with my trauma. It made me realize that the negative effects of past traumatic events did not carry over to my daily life today. I have healed both physically and emotionally more than I thought”. Similar findings have been echoed by Byrne-Davis and colleagues (2006). For instance, when reviewing a similar open-ended question, they discovered that for both EW and control participants, the writing task “brought them to the realization that they were coping well, either with their disease or with other traumatic experiences that had happened to them. This mechanism has not been proposed previously, but it is probable that focusing on a traumatic experience that one has managed to live through, whilst feeling that you are still coping, would have beneficial effects” (p. 679). If the aforementioned argument is true, this is an important finding to take into consideration because it suggests that for at least some EW studies the control group being used is not in actuality a neutral writing condition. Efforts should therefore be made to further investigate these claims so that a more appropriate control group can be utilized if deemed necessary.
Hypothesis 2: Moderating Role of Emotion Regulation

Our second prediction was that emotion regulation abilities would act as a moderator in the EW group, but not for controls, such that EW participants with greater emotion regulation abilities at baseline would demonstrate greater improvements on outcome measures. No support was found for our moderation hypothesis. These results are inconsistent with past research that has suggested emotion regulation abilities are a significant moderator within the EW intervention (Kelly et al., 1997; Kraft et al., 2003 as cited in Lumley, 2004; Kraft et al., 2008; Norman et al., 2004; O’Conner & Ashley, 2008). However, the results are not surprising given the equivocal findings to date surrounding this issue (Baikie, 2008; Frattaroli, 2006; Paez et al., 1999; Solano et al., 2003; van Middendorp & Geenen, 2008; Vedhara et al., 2010). Although past research suggests a physiological index of emotion regulation is a significant moderator (O’Conner et al., 2005; Sloan & Epstein, 2005), our results suggest that other domains of emotion regulation (e.g., emotional awareness, clarity, acceptance, impulsivity) may not be. Another interpretation of the current findings is that a moderating relationship does in fact exist but that for one reason or another we could not detect it. Possible limitations of the current study will be reviewed at the end of this paper in order to offer support for this alternative interpretation.

It is important to highlight that a significant moderation was discovered revealing that difficulties engaging in goal directed behaviour when distressed moderated improvements on posttraumatic stress symptoms at 1-month follow-up. The results demonstrated that for the control group, greater baseline difficulties engaging in goal directed behaviour when distressed was associated with less improvement in posttraumatic stress symptoms at 1-month follow-up. However, EW participants did not demonstrate a relationship between difficulties engaging in goal directed behaviour and posttraumatic stress symptoms at 1-month follow-up, with all
participants improving similarly regardless of their difficulties on this emotion regulation subscale at baseline. Although these results do not provide support for our hypothesis, they are important nonetheless. Specifically, they suggest that emotionally EW may have acted as a buffer to the deleterious effects seen in the control group participants with this particular deficit.

Another important finding from the current study suggested that regardless of group, participants who entered the study with greater emotion regulation abilities improved more on measures of psychological health. Specifically, greater overall abilities regulating emotions (DERS total score) was a significant predictor of greater improvements on depressive symptomatology and posttraumatic stress at 1-month follow-up. When examining the subscales on our measure of emotion regulation, it was discovered that regardless of group, less difficulties engaging in goal directed behaviours when distressed, and greater access to emotion regulation strategies perceived as effective, were predictive of greater improvements in depression scores. Similarly, greater access to emotion regulation strategies perceived as effective were predictive of greater improvements in symptoms of posttraumatic stress. These results are consistent with previous studies that have demonstrated the predictive relationship between emotion regulation and psychological treatment outcome (Ogrodniczuk et al., 2004; McCallum et al., 2003; Watson et al., 2007; 2011). The fact that various emotion regulation abilities were found to be significant predictors of improved outcome suggests that importance of emotion regulation in the recovery from trauma regardless of the intervention provided to participants. Although these findings do not support our moderation hypothesis, they are consistent with other research that suggests the relationship between emotion regulation and psychological adjustment (Campbell-Sills & Barlow, 2007; Greenberg & Watson, 2006; Ford & Kidd, 1998; Linehan, 1993).
Hypothesis 3: Mediating Role of Emotion Regulation

Our third prediction was that greater gains in emotion regulation abilities for EW participants, but not for control participants, would be significantly related to greater improvements in psychological and physical health outcome measures (i.e., the DERS total score and subscale scores would act as a mediator in terms of benefits on outcome measures for the EW group but not for the control group). No support was found for our mediation hypothesis. In fact, improvements in emotion regulation abilities were unrelated to improvements on measures of psychological and physical health for both the EW group and the control group. Again, there are a number of ways in which these results can be interpreted. First, our results could mean that emotion regulation does not mediate improvements in the EW intervention. Although some support does exist demonstrating that increased emotional acceptance (Gortner et al., 2006) and decreased heart rate reactivity (Low et al., 2006) were significant mediators within the EW intervention, other studies proposing to support this claim are limited. Specifically, some of the aforementioned studies assumed a mediating role of emotion regulation based on the fact that writing instructions aimed at attempting to facilitate improvements in emotion regulation abilities resulted in significant improvements on psychological and physical health (Cameron & Nicholls, 1998; King, 2001; King & Miner, 2000). Other studies reviewed that have concluded that emotion regulation acts as a mediator have also been limited because they have failed to conduct proper meditational analyses (Pachankus & Goldfried, 2010). Furthermore, studies that attempted to test the mediation hypothesis correctly have also failed to find significant results (Gortner et al., 2006; Low et al., 2006). Taken together, the equivocal findings in the literature surrounding this issue make it difficult to decipher whether emotion regulation abilities are in fact a mediator within the EW intervention.
A second possible conclusion that can be made from these results is that emotion regulation does mediate improvements in the EW intervention but that we were unable to detect this effect because there are probably numerous mechanisms of action at work. This position has been taken by Pennebaker (2004) who has suggested that individuals are impacted by the EW intervention in many different ways. He suggests that numerous emotional and cognitive changes take place immediately and over time, which likely influence and interact with social and biological processes, making a single explanatory theory improbable. Therefore, it is possible that even if improvements in emotion regulation are one of the many mechanisms of action for the EW intervention, it will be unlikely to consistently identify it given that its influence may depend on a number of other participant and methodological variables.

**Exploratory Analyses: Exploring Arousal Levels**

The results of our study demonstrated that EW participants reported greater arousal in response to their first two writing sessions in comparison to the control participants. However, by the third writing session, these differences diminished as EW participants reported similar levels of arousal to writing as the control group. In fact, analyses revealed that EW participants reported significantly less levels of arousal from session one to session three. This is in contrast to control participants who reported similar levels of arousal across writing samples. This finding is consistent with results obtained by Sloan and colleagues (2005) and suggests that clients’ level of arousal habituated with repeated exposure to writing about their traumatic event. In other words, EW clients demonstrated a greater ability to regulate their arousal with repeated confrontations with their traumatic memory.

In order to probe further for a moderation effect, post-hoc exploratory analyses were conducted using an arousal change score from session one to session three (a crude measure of
arousal regulation). No significant findings were revealed, suggesting that participants that were better able to control their arousal levels in response to the writing did not fare any better than those that were not able to do so. Similarly, in order to probe further for a mediation effect, post-hoc exploratory analyses were conducted using this arousal change score to examine whether greater abilities to control arousal throughout the writing sessions would be related to greater gains in outcome for the EW group, but not the control group. Results revealed that no mediating effects were found for any of the outcome variables. These results are inconsistent with Low and colleagues (2006) who have recently demonstrated that greater within-session heart rate habituation was a significant mediator of physical health symptoms. The lack of significant moderation and mediation effects may be the result of several limitations with the current study.

Limitations and Future Directions

A number of shortcomings with the current study existed that could have limited our ability to obtain significant results in support of our three hypotheses. First, a small sample size may have reduced power, and thus masked the detection of significant findings. Although previous EW studies with fewer participants have demonstrated significant group effects, and a meta-analysis by Frattaroli (2006) surprisingly suggested that EW studies with a smaller sample size resulted in marginally greater psychological health benefits ($r = -.181, p = .058$), collecting a larger sample in future studies is advised. This would assist with determining whether there are other effects that did not emerge in this study and would also increase our ability to determine whether nonsignificant trends discovered represent notable findings.

Similarly, although a total of 71 participants completed the study, 11 participants were excluded from the analyses, resulting in a final sample size of 60 participants (EW = 28, Control = 32). These exclusions were made because participants did not follow writing instructions
properly, or it was later determined that participants did not meet eligibility criteria upon entering the study. Future studies should ensure more careful recruiting, screening, and testing procedures to decrease the need to exclude participants after they have begun their involvement in the study. For instance, this could be accomplished by utilizing a screener that more accurately screens participants for exclusion criteria (e.g., current treatment, appropriate traumatic event, current distress), and by implementing a more meticulous review of the written essays and questionnaires to ensure that participants are following the instructions properly and completing all items on the self-report measures.

Third, in regards to our eligibility criteria, participants that took part in the study were eligible to participate in the study so long as they had experienced a past event that they considered traumatic (with the exception of bereavement). Similar to other EW studies, no attempts were made to define what we meant by a traumatic event. This recruitment strategy may have limited our ability to detect significant findings. By not defining what we considered a traumatic event, the participants in the current study wrote about vastly different distressing topics. For instance, some participants wrote about getting into a heated verbal altercation with a stranger or being fired from work; while others wrote about being in a serious accident or tortured. When reflecting on the differences between events that meet criterion A1 and A2 from the DSM-IV-TR (APA, 2000) and those that do not, it is clear that they are quite distinct in terms of etiology, symptom presentation, the usual trajectory of symptoms, the various treatment options available to address the stressor, as well as likelihood of responding to treatment. Similar to other studies in the literature, the current study did not take these differences into account despite the possibility that the benefits received from engaging in EW may differ depending on the types of traumatic events experienced. Future meta-analytic studies could attempt to examine
this question further. Until then, is recommended that researchers conducting EW studies clearly define what is meant by a traumatic event, while being mindful of this potential limitation. Similarly, because different traumatic events, regardless of whether both meet criteria A1 and A2 from the DSM-IV-TR (APA, 2000), have the potential to be impacted differently by the EW intervention, it would also be interesting for future studies to focus on one specific type of traumatic event as opposed to including multiple types within the same study. Doing so has the potential to clarify some of the inconsistent findings in the literature to date by demonstrating what kinds of traumatic stressors the EW intervention is more or less effective with.

Fourth, the use of self-report questionnaires introduces another possible limitation. It is possible that our null findings are due to limitations of one, or many of the measures used in the current study. However, this possibility is unlikely given psychometrically sound outcome measures were carefully selected for this study based on their psychometric properties and previous administration in EW and psychotherapy outcome research.

On a related note, regardless of whether our measures are psychometrically sound, while self-report measures are among the simplest methods of collecting information from participants, relying solely on self-report data comes with some significant drawbacks; most notably, the possibility of participant response bias (Stone et al., 2000). Participants, for instance, might intentionally or inadvertently answer questions in ways that they believe are expected of them, or they may endorse items in order to create specific impressions. As a result of these possible problems, future studies could address these issues by administering the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1999) which detects various forms of biased responding. Additionally, similar to other outcome studies within the EW and psychotherapy literature, this limitation can by addressed by incorporating the use of reliable and objective
health indicators such as cortisol levels, skin conductance, heart rate levels, as well as brain activity or functioning as measured by various imaging techniques.

Similarly, a sixth limitation of the current study involves the decision to have participants submit their essays to the experimenter. Null findings could have occurred because of issues with self-presentation and concerns about the privacy of participants’ written essays. Support for this exists, as Frattaroli (2006) concluded that studies allowing participants to make private disclosures resulted in marginally greater psychological health improvements ($r = .172, p = .075$) than studies that had participants write in the presence of the experimenter or fellow participants, or those studies that had participants submit their essays for review after the completion of writing. It is possible that participants’ awareness that their writing would be read afterwards prevented them from fully engaging in emotionally EW, thus leading to diminished benefits. Future studies could address this limitation by either informing participants that their writing will not be read or submitted, or being more explicit when providing them with the choice of submitting their essays only if they feel comfortable doing so.

A seventh limitation to the current study involves the possibility that our sample was not experiencing enough distress and that a floor effect occurred. However, after examining the baseline scores for each of the outcome measures, it is evident that our sample endorsed levels of depression and posttraumatic stress comparable to that of the participants in studies conducted by Sloan and her colleagues (Sloan & Marx, 2004a; Sloan et al., 2007), which have repeatedly demonstrated significant improvements on these outcome measures. Additionally, the average score on the DERS at baseline for participants in the current study was well above scores for a sample of healthy college students (Gratz & Roemer, 2004; Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006). These scores were even comparable to symptomatic college student
samples endorsing self harm (Gratz & Chapman, 2007; Gratz & Roemer, 2008) and approaching those experiencing panic attacks (Tull, 2006).

However, the possibility of a floor effect does exist for the PILL. Specifically, the average of the PILL for the total sample in the current study ($M = 18.03$, $SD = 10.92$) was equivalent to that of a “healthy” college sample mean ($M = 17.9$, $SD = 4.5$; Pennebaker, 1982).

When comparing our mean score on the PILL at baseline to other studies in the literature that have repeatedly demonstrated significant group differences in terms of improvements in physical health, it is evident other samples endorsed greater levels of physical health complaints. For instance, studies that have demonstrated significant improvements have had participants endorsing physical health symptom scores ranging from 21.1 ($SD = 8.6$) for EW participants and 22.7 ($SD = 9.3$) for control participants (Sloan & Marx, 2004a), with others reporting scores from 23.1 ($SD = 8.6$) for EW participants and 21.6 ($SD = 8.1$) for control participants (Sloan et al., 2007). Although a floor effect is a possibility, and can perhaps account for the limited findings, research by Epstein and colleagues (2005) demonstrated significant improvements on the PILL for EW participants over control participants, with a sample that entered the study with baseline levels lower than our study. Regardless, in order to prevent the possibility of a floor effect in the future, prospective EW studies could attempt to screen for both psychological distress and physical health symptoms. This recommendation is congruent with results by Frattaroli’s (2006) meta-analysis, which demonstrated that those who reported having greater difficulties with their physical health demonstrated marginally greater reported health benefits ($mean r = .102$, $p = .089$).

An eighth and final limitation worth highlighting has to do with the use of a single 1-month follow-up assessment, which may have hindered our ability to detect longer term
improvements. Although this methodological decision was made in accordance with findings by Frattaroli’s (2006) meta analysis that suggests using follow-up sessions of less than 1 month result in marginally greater overall improvements ($r = .139$, $p = .095$) and significantly greater psychological health benefits ($r = .213$, $p = .024$), some researchers have posited that the physiological benefits that result from EW do not materialize until several months after the writing takes place (Petrie, Booth, Pennebaker, Davis, & Thomas, 1995; Smyth et al., 1999). Although this does not usually hold true for psychological outcome measures (Frattaroli, 2006) or self-reported physical health measures (Epstein et al., 2005; McGuire, Greenberg, & Gevirtz, 2005; Petrie, Fontanilla, Thomas, Booth, & Pennebaker, 2004; Schoutrop et al., 2002), it may be useful to include longer term follow-ups in future studies to address this limitation.

**Concluding Remarks**

The purpose of the current study was to examine the effectiveness of the EW intervention and extend the existing literature by investigating the moderating and mediating role of emotion regulation within this paradigm. Our hypotheses grew out of previous work within the EW literature that has demonstrated the effectiveness of the EW intervention with many different populations of interest. Additionally, as has already been reviewed, support has been provided within the literature (albeit somewhat inconsistently) suggesting that emotion regulation is potentially both a moderating and mediating variable. Our hypotheses were grounded in a model of emotional expression and emotion regulation and the findings of the current study have been reviewed and compared to the existing literature. The results of the current study have only partially supported our hypotheses. Similar to previous studies that have been conducted to date, these equivocal results add to an already inconsistent and unclear EW literature. Some potential reasons for these inconsistent results have been provided throughout the current thesis in an
attempt to explain the findings. To conclude, it is obvious that more research is needed to clarify for whom EW is effective and why it is effective. Although the results of the current study have helped to address and highlight some of the limitations, gaps, and inconsistencies found in the literature to date, future studies should aim to continue incorporating the recommendations proposed in order to further these lines of investigation.
References


Appendix A
Demographic Information

Age: _______________
Gender: _______________

Marital Status:  □ Single  
                 □ Common Law  
                 □ Married  
                 □ Divorced  
                 □ Widowed

Highest level of Education Completed:  □ Some high school  
                                         □ High school diploma  
                                         □ Some university / college  
                                         □ Associate Degree  
                                         □ Bachelors Degree  
                                         □ Advanced Degree

Occupation: ________________________________________________________________

Primary language: ____________________________________________________________

Ethnicity: __________________________________________________________________

Previous psychotherapy experience: _______________________________ or N/A

Previous psychotropic medication(s): _______________________________ or N/A

Amount of previous disclosure about trauma:  □ None  
                                               □ Little  
                                               □ Moderate  
                                               □ A lot

Amount of time the traumatic experience occurred for (in days / months / years): __________

Amount of time since the trauma occurred (in days / months / years): _________________
Appendix B
Manipulation Check Questionnaire

Listed below are a group of statements that address the writing that you have completed in this study. Please rate the extent to which you feel each statement corresponds with your writing experience. If you do not feel that the statement corresponds with your experience at all, circle 1. If you feel that the statement corresponds a great deal, circle 7. If you feel somewhere in between, circle any of the numbers between 1 and 7. Please respond honestly, since there are no right or wrong answers.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at All</td>
<td>Somewhat</td>
<td>A Great Deal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I feel that my writing was personal ................................................ 1 2 3 4 5 6 7
2. I feel that my writing was emotional ................................................. 1 2 3 4 5 6 7
3. I found it difficult to write ............................................................. 1 2 3 4 5 6 7
4. I feel that my writing was disclosing .............................................. 1 2 3 4 5 6 7
5. I feel that my writing was beneficial ............................................... 1 2 3 4 5 6 7
6. I feel that my writing was valuable ................................................ 1 2 3 4 5 6 7
Appendix C
Open Ended Question

Do you feel that your writing was helpful in dealing with your trauma? If so, please explain why you think it may have helped.
Appendix D

Online Advertisement

You are invited to participate in a research study being conducted by Justin Mattina, M.A., Ph.D. candidate, and Jonathan Danson, B.A., M.A. candidate, from the department of Adult Education and Counselling Psychology at the Ontario Institute for Studies in Education at the University of Toronto. This study is being conducted under the supervision of Dr. Jeanne Watson, Ph.D., C.Psych.

The purpose of this study is to investigate the process of recovering from a trauma. If you have ever experienced an event that YOU would consider traumatic (e.g., bullying, assault, accident, robbery, injury, witness to a trauma, etc.), and are currently feeling some distress related to this event, you may be eligible to participate. Qualifying participants must also meet the following criteria:

1) Between the ages of 18 and 65
2) Able to speak, write and read English fluently
3) Have not written in a personal diary for at least 12 months
4) Do not identify the death of a loved one as the traumatic event
5) Not currently involved in psychotherapy
6) Not currently taking any psychotropic medications (e.g., antidepressants)
7) Not currently at risk of harming yourself or another individual

Qualifying individuals who participate in all phases of the study will be compensated $40, and be entered into a draw to win an additional $100. Participation will involve coming to our offices at OISE/UT, located at 252 Bloor Street West (Bloor & St. George).

If you are interested in participating or have any questions, please contact us at 416-978-0702. If you know anyone who might be interested, we would appreciate it if you would pass along this message.

Thanks!
Participants Needed

To take part in a study investigating the process of recovering from a traumatic event

Have you ever experienced an event that you would consider traumatic (e.g., bullying, assault, accident, robbery, injury, witness to a trauma)? Does this event still cause you to feel some distress? If so, you may be eligible to take part in this research.

Qualifying participants must also meet the following criteria:

1) Between the ages of 18 and 65
2) Able to speak, write, and read English fluently
3) Have not written in a personal diary for at least 12 months
4) Do not identify the death of a loved one as the traumatic event
5) Not currently involved in psychotherapy
6) Not currently taking any psychotropic medications (i.e., antidepressants)
7) Not currently at risk of harming yourself or another individual

Qualifying participants will be compensated $40 and will have the chance to win an additional $100 upon completion.

Interested? Please call 416-978-0702
Appendix F

Emergency Contact Resources

If you feel that you are need of assistance, please refer to the numbers below. **Helplines** should be called if you wish to talk to someone anonymously, or if you would like advice on what to do next. **Hospital emergency rooms** should be called and/or visited if you feel that you are at risk for harming yourself, harming someone else, or if you feel you cannot cope with your current distress. **University counselling centres** should be called and/or visited if, during regular business hours, you would like to schedule a future appointment with a counsellor or if you are interested in obtaining resources that might help with your distress (e.g., information booklets). **Crisis teams** should be contacted if you feel you are in need of immediate assistance and are not sure what to do next.

**Helplines**

- **Kids Helpline (up to age 20)**
  1-800-668-6868

- **Assaulted Women’s Helpline**
  1-866-863-0511

- **Sexual Abuse Hotline**
  416-597-8808

- **Distress Centres of Toronto**
  416-408-4357

- **Telehealth Ontario**
  1-866-797-0000
**Hospital Emergency Rooms**

**North York General**
(Sheppard & Leslie)
416-756-6001

**Humber River Regional**
(400 & Finch)
416-747-3833

**St. Michael’s**
(Yonge & Queen)
416-864-5346

**Toronto Western**
(Bathurst & Dundas W)
416-603-5757

**Scarborough General**
(Lawrence & McCowan)
416-431-8200 ext. 6300

**Toronto General**
(College & University)
416-340-3946

**York Central**
(Major MacKenzie, between Bathurst and Yonge)
905-883-2041

**Centre for Addiction and Mental Health**
(Queen & Ossington)
416-979-6855

**Hamilton General**
(Barton, between Wellington and Victoria)
905-521-2100
University Counselling Centres

Ryerson University Centre for Student Development and Counselling
(Jogenson Hall, Room 07)
416-979-5195

University of Toronto Counselling and Learning Skills Service
(Koffler Student Services Centre, Room 111)
416-978-7970

York University Counselling and Development Centre
(Bennett Centre for Student Services, Room N110)
416-736-5297

McMaster University Centre for Student Development
(McMaster University Student Centre, B107)
905-525-9140

Crisis Teams

Durham Mental Health Services
1-800-742-1890 or 905-666-0483

The Gerstein Centre
(Toronto)
416-929-5200

The Integrated Community Mental Health Crisis Response Program
(North York and Etobicoke)
416-498-0043

Peel Crisis Team
905-278-9036

Scarborough Mobile Crisis Team
416-289-2434

York Support Services
310-2673

Crisis Outreach and Support Team
(Hamilton)
905-972-8338
Appendix G
Consent Form

Exploring the Effects of Writing on Recovery from Trauma

You are invited to participate in a research study being conducted by Justin Mattina, M.A., Ph.D. student, and Jonathan Danson, B.A., M.A. student, from the department of Adult Education and Counselling Psychology at the Ontario Institute for Studies in Education at the University of Toronto. This study is being conducted under the supervision of Dr. Jeanne Watson, Ph.D., C.Psych. Results obtained will contribute to the thesis and dissertation of the investigators.

If you have any questions or concerns about the research, please feel free to contact the above researchers at 416-978-0702, or Dr. Jeanne Watson at 416-978-0705. In emergency situations, please refer to the Emergency Contact List provided.

PURPOSE OF THE STUDY

The purpose of this study is to investigate the role that writing may play in the process of recovering from trauma. We intend to have different people write about different topics to determine which types of writing instructions might be most beneficial.

PROCEDURE

This study will consist of 3 parts:

1. Questionnaires

   In the first session, participants will complete a series of written questionnaires, which will take approximately 35 minutes.

2. Writing

   Participants will be asked to complete three 20-minute writing sessions, one on each of three consecutive days. The first writing session will begin today after participants complete the series of questionnaires that will be provided. Details regarding the topic to be written about will be provided to the participant prior to the initial writing session. All writing sessions will take place here at the University of Toronto in one of our private office spaces. After the writing has taken place, and you have filled out a short questionnaire, you will be asked to submit your essay and questionnaire in an envelope which will not be looked at by your primary experimenter. Although we prefer to have you submit your essay(s), if you chose not to have anyone read it you may keep it and take it home with you.
3. Follow up

At the end of the third writing session a follow-up appointment will be set, which will take place approximately one-month from the third session. This session will be dedicated to filling out a series of questionnaires. Completion of the questionnaires will take approximately 35 minutes; since these are invaluable to the research study, it is important that participants intend to complete all phases of the experiment. Upon completion, participants will have the opportunity to learn more about the study, and will be provided with all instruction sets used within the study. Additionally, when the data collection phase of the study is complete and the results are analyzed, participants will be emailed information about which instruction set was most beneficial and other related findings of the study.

PARTICIPATION AND WITHDRAWAL

Participation in this study is voluntary. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also exercise the option of removing your data from the study or refusing to submit your essay(s) at any time. You may also refuse to answer any questions you don’t want to answer and still remain in the study.

CONFIDENTIALITY

Any data obtained through this study is confidential and will be kept in a locked cabinet, which is accessible only to the experimenters and the supervisor Psychologist. The participant number that was previously assigned will act as the only identifying marker on any work submitted. Additionally, when submitting information to the experimenter, participants will be provided with an envelope in which all questionnaire data and writing packages will be placed. As such, all participants and the work they submit will remain anonymous and unknown to the experimenter. The one exception to this is if your writing/questionnaires indicate that you intend to harm yourself or others. In cases like this, we are legally and ethically bound to match your ID number with your name and inform the authorities to ensure the safety of you and others. It is important to mention, however, that your particular experimenter will not read any of your questionnaire or writing materials. Instead, a research assistant, who you will never meet, will review your materials immediately after they are submitted. We will only match your ID number with your name if the research assistant believes it is legally/ethically necessary. This is the only case in which your experimenter will be alerted and asked to read your essay/questionnaires and be aware that it is yours.

POTENTIAL RISKS AND DISCOMFORTS

Participants in the study may experience some emotional or physical distress. This distress, however, is usually minimal and short lived. In case this occurs, a list of emergency and other contact resources will be provided.
In addition, the therapeutic value of this study to participants may vary depending on which set of writing instructions they are given. Upon study completion, however, all participants will be given all instruction sets that were used in our study. Also, once data is collected and analyzed, you will be able to gain information about which instruction set was deemed to be most beneficial.

PAYMENT FOR PARTICIPATION

Participants in this study will be compensated ten dollars ($10.00) for each writing session attended and the follow up session. Accordingly, participants who complete the study will receive a total of forty dollars ($40.00).

In addition, participants who take part in the one-month follow up session will be entered into a draw to win a one hundred dollar ($100.00) cash prize.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. Results obtained through this study will be made available upon request. If you have questions regarding your rights as a research participant, please contact:

Office of Research Ethics
University of Toronto
McMurrich Building, 3rd Floor
12 Queens Park Crescent West
Toronto, ON, M5S 1S8

Telephone: 416-946-3273
Fax: 416-946-5763
E-mail: ethics.review@utoronto.ca
I, _____________________________ have read and understood the information above, and give my consent to participate in the current study. As well, I agree to have the data collected used for future projects, including scholarly presentations, journal articles and research studies (to be conducted under the supervision of Dr. Jeanne Watson and/or Justin Mattina, M.A.).

NOTE: all data used for future projects, presentations, or journal articles will ensure anonymity by removing all identifying information.

I also acknowledge that a copy of this form has been provided to me.

Please sign and date below if you agree to all of the above conditions.

_________________________________  _________________________________
Signature                                      Date
Appendix H

Debriefing Form

Thank you for participating in the final phase of the study. Your commitment to completing all portions of our study is greatly appreciated.

As stated earlier, the purpose of this study is to investigate the role that writing may play in recovery following a traumatic event. Specifically, we are interested in examining whether expressive writing (EW) is helpful to people who are experiencing ongoing distress. Some studies have found that writing about a traumatic event can be beneficial for some people. We wanted to investigate the effect of different instructions. In this study, one group was asked to write about an assigned topic that did not relate to a previously experienced traumatic event in a factual, non-emotional way, while the second group was asked to describe a previously experienced traumatic event with as much emotion as possible. The goal is to determine whether instructions that ask for emotionally expressive writing leads to greater self-reported changes on measures of mood, emotional processing, physical symptoms, and bodily sensations than general instructions to write. Secondly, we are investigating whether writing emotionally about a traumatic event is influenced by a participant’s level of self-presentation and emotional processing.

Given the two groups received different writing instructions, we are going to provide you with the instructions for both groups used within our study so that you can use either one on your own at home. We will also provide you with a summary of the findings of this study, including which instruction sets were beneficial, when we have completed our investigation. If you have any questions about the instructions, please feel free to contact the researchers at the number provided.

For completing the final phase of the study, your name has been entered into a draw to win a one hundred dollar ($100.00) cash prize. The draw will take place as soon as all participants have completed the study, and you will be contacted if you are the winner.

Thank you again for all of your help in completing this study!!

If you have any further comments, questions, or concerns feel free to contact the experimenters at 416-978-0702, or Dr. Jeanne Watson at 416-978-0705.
Appendix I

Writing Instructions

Instructions given to all participants

This study is an extremely important project looking at the effects of writing. Over the next three days, you will be asked to write about one of two different topics for 20 minutes each day. You will be situated in a private location where you will be left alone to write after reading the instructions. The person who takes you to the office will close the door: this will be your sign to begin writing. At the end of 20 minutes of writing, the experimenter will knock on the door to let you know that the 20 minutes is up. At this point we would like for you to stop writing, and to place your essay in the envelope provided.

The only rule we have about your writing is that you write continuously for the entire time. If you happen to run out of things to say, just repeat what you have already written. In your writing, don’t worry about grammar, spelling, or sentence structure. Just write. Different people will be assigned to write about different topics so it is important that you refrain from discussing this experiment with anyone. Because it is a rigid experiment, we can’t tell you what other people are writing about or anything about the predictions of the experiment. Once the study is complete, however, we will tell you everything. Another thing to mention is that sometimes people feel a little sad or anxious after writing. If this occurs, it is completely normal. Most people say that the feelings go away within a couple of hours. If at any time during the experiment you feel upset or distressed and would like to talk to a trained counsellor, please contact Dr. Jeanne Watson, Justin Mattina, or Jonathon Danson immediately, or call the crisis telephone number which will be provided to you.

One last thing to mention is that your writing is completely anonymous and confidential. Your information is coded with an ID number, so please refrain from writing your name anywhere in the booklet. Some people in the past have preferred that nobody read their writing. This is OK. However, we do prefer that you turn in your writing samples, as we are interested in what people write. I promise that your experimenter will not be able to link your writing to you. The one exception to this is if your writing indicates you intend to harm yourself or others. In cases like this, we are legally bound to match your ID with your name and inform the authorities to ensure the safety of you and others. In order to do this and respect your privacy we will have a research assistant (in which you will not meet) read your essays once you submit your information, and only have your experimenter alerted if it is deemed legally/ethically necessary. Above all, we respect your privacy. Do you have any questions at this point? Do you still wish to participate?
Experimental Condition Writing Instructions

On the first day of Writing:

For the next 3 days, we would like for you to write about the most stressful, upsetting, and traumatic experience of your entire life. In your writing, we want you to really let go and explore your very deepest emotions and thoughts about the experience. Whatever you choose to write about, please keep in mind that it is critical that you really delve into your deepest emotions and thoughts. Ideally, we would also like you to write about a traumatic event that you have not discussed in great detail with others. Remember that you have three days to write. You might want to tie your experience to other parts of your life. How it has impacted you personally, emotionally, and socially, how it is related to your childhood and your development, the people you love, or how it has shaped who you are today and who you want to be. Again, in your writing please examine your deepest emotions and thoughts.

On the second day of Writing:

How did yesterday’s writing go? Today, we want you to continue writing about the same traumatic experience that you wrote about yesterday. Today, what is important is that you express your deepest emotions and thoughts about the experience.

On the third day of Writing:

Today is the last writing session. In your writing today, we again want you to continue writing about the most traumatic and upsetting event that you have wrote about for the last two days. Remember that today is your last writing day so you may want to wrap everything up. For instance, how is this traumatic event related to your current life situation and future? But feel free to go in any direction you feel most comfortable with. What is important is that you delve into your deepest emotions and thoughts.
Control Condition Writing Instructions

On the first day of Writing:

For the next 3 days we would like for you to write about how you use your time. Each day we will be giving you a different writing assignment on how you use your time. In your writing, we would like for you to be as objective as possible. We are not interested in your emotions or your opinions. Instead, we would like for you to be as factual and objective as possible. Feel free to be as detailed about the facts as you like. For today’s topic, describe what you did yesterday from the time you got up until the time you went to bed. For example, you may 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. The most important thing is that you only write objectively and factually about how you spent your time, refraining from including any information about your opinions or emotions.

On the second day of Writing:

How did yesterday’s writing go? Today, we would like you to describe what you have done today since you woke up. Again, be as objective as possible, with no description of emotions or opinions. Please describe exactly what you have done up until starting this experiment.

On the third day of Writing:

You have now written for two days and today is the last writing session. Today, we would like you to describe what you will be doing over the next week in as much detail and as accurately as possible. The most important thing is that you only write objectively and factually about this topic, refraining from including any information about your opinions or emotions.