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# Writing to Heal: What Kinds of Emotions Predict Outcome in Expressive Writing?

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Writing to Heal: What Kinds of Emotions Predict Outcome in Expressive Writing?

By

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Writing to Heal: What Kinds of Emotions Predict Outcome in Expressive Writing?


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ABSTRACT

In the current study, the aim was to explore whether certain types of emotions that emerge in participants' personal narratives of past traumatic events are associated with subsequent improvement in emotional well-being following expressive writing. The sample was archival data consisting of 255 undergraduate students. Participants' narrative material was coded for the presence of key emotions. Participants' psychological well-being was assessed at baseline, and at 17 and 31 days post-intervention. Participants were observed to evidence different key emotional states that were differentially associated with symptom distress. No relationship was observed between expressions of different emotions and participants' subsequent emotional development. Findings suggest that participants do not always adhere to writing instructions; personal narratives are revealing of symptom distress; and repeated writing, emotional or non-emotional, may enhance emotional well-being in general.

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CHAPTER I

Introduction

**Expressive Writing as an Intervention**

In a seminal study, Pennebaker and Beall (1986) demonstrated that 46 undergraduate students who wrote about their experiences of past upsetting events for 15 minutes over four consecutive days experienced fewer health and psychological problems six months later. This ignited a long and ongoing research inquiry that demonstrates the benefits of expressive writing on one's health, emotional wellbeing, and quality of life. Today, expressive writing, or written emotional disclosure, has been established as an intervention (see Baikie & Wilhelm, 2005; Pachankis & Goldfried, 2010), wherein individuals write about their thoughts and emotions in relation to a past upsetting or traumatic event over a brief period of time (i.e., usually 15 to 20 minutes).

**Writing about traumatic events.** Expressive writing has been found to facilitate psychological well-being and improve health among individuals who struggle with unresolved feelings about past upsetting events. In an attempt to establish the extent to which expressive writing benefits individual's functioning, Frattaroli (2006) conducted a meta-analysis of 146 studies that involved randomized control trials of expressive writing and demonstrated that the mean effect size was Peason's $r = .075$, 95% CIs [.051, .098], based on $N = 10,994$ participants. Expressive writing improved a variety of health problems, including reduction in fatigue and illness-related behaviours ($r = .073$, 95% CIs [.015, .131], $n = 4690$). Expressive writing also improved various aspects of psychological functioning, including reduction of distress ($r = .102$, 95% CIs [0.042, 0.161], $n=2435$). Further, expressive writing as an intervention demonstrates a variety of

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advantages: The task is essentially free (i.e., no therapist is required), is convenient (i.e., it may be administered at any time of day, at one's own convenience), and is brief (i.e., the task takes 15 to 20 minutes at a time). Although expressive writing yields a much smaller effect size compared to other types of intervention such as psychotherapy (e.g., $r$ = .80; Wampold, 2001), in the scope of these practical characteristics, the impact expressive writing has on wellbeing warrants research attention. In particular, the question of *how* improvement in functioning occurs should be further investigated. Gaining insight into the productive processes of expressive writing may inform ways through which the intervention may be used to produce the optimal benefits.

**Psychological benefits.** Since the original study by Pennebaker and Beall (1986), researchers have extended the application of expressive writing to various subclinical and clinical populations who report of having had emotional struggles with their past experiences with a range of different events. In a sample of employees, Barclay and Skarlicki (2009) demonstrated that workers who wrote about their negative thoughts and feelings about a past workplace injustice experienced improved psychological wellbeing, less anger, fewer intentions to retaliate, and increased levels of personal resolution. In several studies involving adolescents, investigators demonstrated that expressively writing about their negative experiences about stressful or violent events decreased adolescents' distress and tendency to engage in violence (Kliewer, Lepore, Allison, Meyer & Greene, 2011; Soliday, Garofalo, and Rogers, 2010). Similarly, several studies demonstrated that college students who wrote expressively about their emotional upheavals or academic stress experienced less distress and depressive symptoms (Gortner, Rude & Pennebaker, 2006; Opre, Coman, Kallay, Rotaru & Manier, 2005). In the context

of romantic breakups, Lepore and Greenberg (2002) demonstrated that female college students who wrote about their thoughts and feelings about the relationship experienced less fatigue related to their heartbreak and less tension towards their ex-partners. Moreover, individuals who expressively wrote tended to be more likely to re-unite with their ex-partners compared to their control counterparts. Expressive writing also has produced consistent effects among various clinical populations. Several studies have demonstrated that expressive writing contributed to improvements in the symptoms of PTSD (e.g., Meston, Tierney, Stephenson, 2013; Possemato, Ouimette, & Geller, 2010; Sloan & Marx, 2004), depression (e.g., Koopman et al., 2005; Meston, Tierney, Stephenson, 2013; Gortner, Rude, & Pennebaker, 2006) and anxiety (Graf, Gaudiano, & Geller, 2008). The beneficial effects of expressive writing seem to have been demonstrated in a range of both subclinical and clinical populations who report having unresolved feelings or struggles with a wide array of traumatic or stressful experiences.

**Goal of the current study: Explore the role of emotional processing in the psychological benefits observed following the expressive writing task.** Although much research has focused on establishing the efficacy of expressive writing on reducing clinical symptoms and improving mental health, less is known about the processes that produce the observed benefits. In other words, the question of what style or content of expressive writing maximizes positive change, has become increasingly important. Examining this issue will provide insight into the underlying processes that produce or hinder subsequent psychological development and on the potential ways to optimize the benefits of expressive writing as an intervention.

Trauma exposure is alarmingly common. It has been estimated in the United States and Canada that 39 to 84% of individuals in the general population are exposed to at least one potentially traumatic event in their lifetime (Breslau, Davis, Andreski, & Peterson, 1991; Breslau, Kessler, Chilcoat, Schultz, Davis, & Andreski, 1998; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Norris, F. H., 1992; Stein, Walker, Hazen, & Forde, 1997; Van-Ameringen, Mancini, Patterson, & Boyle, 2008; Vranas & Lauterbach, 1994). The prevalence rates may differ across these studies on the basis of the different methods used in the data collection and the qualifying criteria used to define a traumatic event. For instance, Van-Ameringen and colleagues (2008) conducted the Composite International Diagnostic Interview (CIDI, Version 2.1; World Health Organization, 1997) on $N = 2991$ Canadian individuals in the general population wherein a traumatic event was defined as involving an actual or perceived life threat, some form of actual or perceived serious physical or psychological injury, which could include forms of sexual assault. Common traumatic events in that study included an unexpected and sudden death of someone, sexual assault, automobile accident, and witnessing the death of someone, among others. It was estimated in the study that 76.1% of Canadians are exposed to at least one traumatic event in their lifetime. However, not all people who experience trauma go on to suffer diagnosable symptoms. The rate of lifetime PTSD prevalence in the United States and Canada is estimated to be 7.8 to 9.2% (e.g., Breslau et al., 1991; Van-Ameringen et al., 2008). Further, in a recent meta-analysis, Santiago and colleagues (2013) demonstrated that, of those who experienced traumatic exposure as "death or threatened death, actual or threatened serious injury, or actual or threatened sexual violence…" per the Diagnostic and Statistical Manual of Mental Disorders (5th ed.;

DSM–5; American Psychiatric Association, 2013), 17% went on to develop PTSD within the first year. Given the high prevalence of traumatic exposure and the subsequent development of mental health problems, expressive writing is promising as a useful intervention that is easily accessible, brief, and very cost-effective in the form of a stand-alone procedure or as an introduction to, or adjunct to, treatment.

**How Do Emotional Change Processes Occur?**

First conceptualized by Groves and Thompson (1970), emotional processing refers to the ways in which humans problem solve with affective information and, in its adaptive function, transform their emotional experiences toward optimal psychological functioning and personal development. Within this general framework, however, the term "emotional processing" has come to describe different processes, depending on the theoretical context within which it is examined.

**Venting/catharsis.** In the early studies of expressive writing, the psychoanalytic idea of catharsis was proposed as the underlying mechanism of change, wherein subjects benefited from "disinhibiting" and openly expressing their thoughts and emotions about an upsetting event (e.g., Pennebaker & Beal, 1986). The underlying premise was that individuals tended to inhibit their behaviours, thoughts, and feelings regarding a traumatic event, and this process routinely created psychological stress that subsequently produce physical and emotional symptoms (e.g., Seyle, 1976). However, as more studies were accumulated in this area, findings revealed that this catharsis-venting explanation might not be adequate. First, researchers found mixed results regarding the importance of the un-disclosed nature of the trauma material. According to the catharsis-venting explanation, individuals who never disclosed their traumatic experience were at the

heightened risk of inhibitory stress and thus should have benefited optimally from the expressive writing task; however, individuals who expressively wrote about previously disclosed vs. non-disclosed stressful events did not differ in their subsequent experience of psychological benefits (e.g., Greenberg & Stone, 1992). Similarly, individuals who differed in the extent to which they routinely inhibited their thoughts and emotions about a past traumatic event did not differ in their experience of psychological gain following the expressive writing task (Francis & Pennebaker, 1992). Again, the findings did not support the catharsis-venting hypothesis, to the extent that the hypothesis predicted pronounced gains among those who routinely inhibit their thoughts and emotions.

**Repeated exposure and habituation.** Another emotional processing model proposed to produce the psychological benefits of expressive writing is derived from behaviourism. In this model, emotional processing that occurs during expressive writing is analogous to habituation that occurs in exposure-based therapies, wherein clients' emotional reaction of distress to a traumatic event becomes attenuated over repeated exposure to the trauma-related stimuli. Originally developed to treat anxiety disorders, clients in exposure therapy are encouraged to confront the feared or anxiety-provoking stimuli in a safe environment, with the aim to correct their hyperaroused fear response that is usually disproportionate with the real threat of the stimuli (Foa & Kozak, 1986). Clients who undergo repeated exposure in this manner begin to show less distress in response to encountering trauma-related stimuli. This process, referred to as *habituation*, is considered to be the mechanism of emotional processing within the behavioural perspective. Indeed, several studies have shown that individuals who expressively write experience a reduction in physiological arousal, psychological distress, and intrusive and

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avoidant thoughts regarding trauma in the subsequent writing sessions. These benefits are

maintained for as long as 7 weeks following the paradigm (e.g., Klein & Boals, 2001;

Pascual-Leone et al., 2011; Sloan & Marx, 2004), although the findings have been mixed.

Therefore, previous studies suggest that habituation might be partially responsible for

producing the salubrious effects of expressive writing.

**Cognitive re-appraisal of emotional events.** Cognitive processing has been

proposed as a mechanism of emotional change process, wherein individuals evaluate their

traumatic experiences in ways that provide them with the insight into their own emotional

reactions to the trauma (e.g., Silver & Wortman, 1980; Samoliov & Goldfried, 2000).

Organizing and understanding the affective material in new and more meaningful ways is

thought to result in a variety of cognitive processes that are beneficial to one's

psychological wellbeing. When a life upheaval occurs, individuals' view of the world as

a safe place, and their sense of self-worth, may become challenged. Reappraisal of

traumatic material provides a way to understand the traumatic event in a meaningful

framework, and the event will come to be perceived as less harmful or threatening than

previously thought. These processes are thought to reduce distress and facilitate the

integration of the traumatic experience with one's understanding of one's self and of the

world in a non-threatening manner, thus allowing emotional development. In line with

this theoretical model, Pennebaker and colleagues (1990) found that participants found

expressive writing to be beneficial to the extent that the task provided them with an

insight into understanding their thoughts and feelings regarding the traumatic event. As

more studies were conducted, however, evidence seems to have become mixed. Lu and

Santon (2010) altered writing instructions to promote cognitive reappraisal and found that

a focus on cognitive re-apprsaisal did not produce psychological benefits that differed

from those obtained in other conditions in which the focus was on emotional disclosure

or a mixture of emotional disclosure and cognitive reappraisal. Similarly, Hunt, Schloss,

Moonat, Poulos, and Wieland (2007) found that participants who focused on cognitive

restructuring increased, rather than decreased, depressive symptoms following an

expressive writing paradigm. Finally, Nazarian and Smyth (2013) found that altered

instructions to promote repeated exposure to the same thoughts and feelings associated

with a traumatic event not only facilitated habituation, as predicted by the exposure

model, but also increased cognitive appraisal. Based on this and past findings,

investigators proposed that experimentally altering writing instructions to focus on a

specific process might also produce increases or decreases in a wide array of processes,

sometimes in unexpected ways. Taken together, preliminary research exploring the role

of cognitive reappraisal as a mechanism of emotional processing remains inconclusive

and is in need of further investigation.

**State-transitional model of emotional processing.** Originally developed to

capture client's meaningful change in psychotherapy, Pascual-Leone and Greenberg's

model of emotional processing (2007) is a step-wise model of emotional processing

designed to identify moment-by-moment emergence of emotions from distress towards

resolution. Emerging within the theoretical context of Greenberg's view of emotional

processing (2002), in the original study, Pascual-Leone and Greenberg (2007) examined

videotaped psychotherapy sessions and found that clients expressed emotions that were

either productive or un-productive to the extent that these emotions predicted successful

outcome. Stated another way, expressions of some types of emotional states (but not all)

seemed to facilitate psychological well-being and personal resolution in these clients. Based on these observations, a new state-transitional model of emotional processing was developed.

Global distress is the initial key component described in this model and is characterized by vague and non-specific distress. Individuals in global distress are highly emotionally aroused but are often unable to articulate the cause of their distress and lack a sense of direction in regards to understanding and resolving their difficulties. Individuals must first process this undifferentiated and often overwhelming emotional pain in order to progress through the healing process.

Fear/shame as a unit comprises the second-level emotional state that is more specific in content compared to global distress. Individuals in this state are characteristically aware of the cause of their distress and experience this state as an enduring and familiar type of pain that is rooted within some specific autobiographical context. Fear/shame is therefore a highly personal and idiosyncratic emotional state that is often expressed as feelings of loneliness, incompetence, or inadequacy.

At the comparable level of processing as fear/shame, rejecting anger is an emotional state that is also enduring and specifically rooted within autobiographical context. Unlike fear/shame, however, rejecting anger is expressed as a type of anger that rejects or creates distance from the source of emotional pain. Individuals who proceed beyond these states of fear/shame or rejecting anger typically do so by synthesizing their negative evaluation towards themselves with some existential need, in a way that allows for the emergence of positive self-evaluation.

Moving onward, hurt/grief, assertive anger, and self-compassion (formerly self-soothing) are the advanced emotional states and are characterized by a regulated level of emotional arousal and a high level of meaning-making. Individuals in hurt/grief recognize their loss or woundedness and are able to express their pain without collapsing into negative self-evaluation, despair, or resignation that often mark the earlier, less advanced emotional states. Assertive anger and self-compassion are considered to be functionally equivalent on the basis that individuals in both states engage in positive self-evaluation and acknowledge their existential need. On the one hand, individuals in assertive anger assert their value and/or existential need through a healthy sense of entitlement; on the other hand, individuals in self-compassion attempt to fulfill their sense of value and/or existential need by attending to it themselves, without reliance on the external world. Individuals may vacillate amongst these three advanced emotional states until the most resolved emotional state, resolution, is reached.

In the state-transitional model, the three earlier emotional states, global distress, fear/shame, and rejecting anger, are considered to be "early expressions of distress" because they are found in psychotherapy sessions wherein trauma is either resolved or not yet resolved. These emotional states are characterized by a high level of emotional distress and a low level of meaning-making directed towards personal resolution. By contrast, assertive anger, self-compassion, hurt/grief, and resolution are considered to be "advanced meaning-making states" because they are found only in those cases wherein trauma is resolved. These emotional states are characterized by a moderate and regulated level of emotional arousal and a high level of meaning-making directed towards personal resolution or "closure". In the original study, all clients seemed to express early

expressions of distress, but only those who also expressed advanced meaning-making states experienced successful therapeutic outcome and positive emotional change. Therefore, only advanced meaning-making states seem to be associated with trauma resolution and improved emotional wellbeing. Several studies that explored in-session emergence of emotional states have confirmed these predictions (e.g., Pascual-Leone and Greenberg, 2007; Pascual-Leone, 2009; Singh, 2008; Kramer, Pascual-Leone, Despland, & de Roten, 2014). Based on these findings, Pascual-Leone and Greenberg's model of emotional processing (2007) seems promising as a conceptual framework within which psychological benefits of expressive writing may be examined.

**Current Study**

Several studies in recent years have focused attention on exploring *how* expressive writing produces an increase in psychological wellbeing. The main purpose of the current study was to contribute to this growing literature by exploring whether writing on different emotional states as identified within the framework of Pascual-Leone and Greenberg's state-transitional model (2007) differentially impact participants' psychological wellbeing following the expressive writing task. Exploring the process rather than the content of writing is a new research focus in this area. Indeed, in the meta-analysis by Frattaroli (2006), only 6 out of 146 studies manipulated the writing instructions with the aim to facilitate various processing styles, such as cognitive reappraisal and exposure. Since the publication of the review, several more studies have explored the effects of manipulating the process of writing (e.g., Lu & Santon, 2010; Nazanian & Smyth, 2013). In these studies, different writing instructions were provided with the aim to enhance the presumed change processes. To our knowledge, the previous

study by Harrington (2012) and the current study were the first to investigate the qualitatively different types of emotional states expressed during expressive writing (beyond simple positive vs. negative emotion). Using the state-transitional model offers a way to systematically examine how people write about emotion, rather than simply distinguishing whether or not people write about emotion at all. The state-transitional model seems especially suited to studying emotional processing in expressive writing because of its focus on identifying the range of emotional states associated with the process of resolving psychological distress and predicting subsequent psychological change. Given that participants in an expressive writing task are instructed to write about their experiences in relation to a past traumatic event, their thoughts and emotions will conceivably share characteristics with those experienced by clients in psychotherapy who are moving from the initial expressions of distress towards later expressions of personal resolution. Based on this premise, the state-transitional model seemed to be a promising approach to exploring emotional processes that facilitate emotional development following expressive writing in the current study.

**Parent Study.** The sample was archival data from a larger parent study (Pascual-Leone et al., 2011) and consisted of the narrative material from 260 undergraduate students who expressively wrote for 15 minutes at a time over three consecutive days. In the original study, writing instructions were altered based on the state-transitional model of emotional processing to promote participants to write about different sets of emotional states in reference to the traumatic event. A task control group was also included, wherein participants wrote a non-emotional account of what they did in the previous 24 hours.

**Rationale.** The following section outlines the rationale for the method and hypotheses in the current study.

*Process-directive approach in expressive writing.* In recent years, a new research focus has begun to emerge that aims to identify the processes that produce the psychological benefits observed following an expressive writing task. One approach to this research question involves altering writing instructions to promote these particular types of emotional processing and examine whether participants differ in their subsequent experience of benefits (e.g., Kovac & Range, 2002; Nazarian & Smyth, 2013; Schutte, Searle, Meade & Neill, 2012; Vrielynck, Philippot & Rime, 2010). In one such study, Nazarian and Smyth (2013) provided participants with different writing instructions that are modelled after the different theories of emotional processing. In spite of this manipulation, however, the investigators found that altered instructions sometimes promoted different emotional processing than they were designed to target. Specifically, the investigators demonstrated that participants who were given the exposure-focused writing instructions showed more habituation over the course of the writing sessions, as predicted by the exposure model of emotional processing, but as indicated earlier, they also showed more cognitive processing. Based on these findings, the investigators proposed that, while writing instructions can be altered to promote certain types of emotional processing, this alteration might influence a wider range of processes than those proposed specifically by the relevant theoretical models after which the instructions were modelled. Indeed, Harrington (2012) investigated this issue by utilizing writing instructions that were modelled after a different theoretical model, the state-transitional model (Pascual-Leone & Greenberg, 2005), and demonstrated similar findings.

Harrington's study was also based on a different set of narrative data from the same parent study (Pascual-Leone et al., 2011), and it provides preliminary findings that will be replicated and expanded upon by the current study, as will be discussed.

In Harrington's research design (2012), writing instructions were provided to enhance specific emotional processes thought to correspond with various sets of the emotional states described in the state-transitional model. While the key emotional states could be successfully identified in the written narratives, Harrington found that participants' emotional processing profiles did not relate, or only weakly related to the original writing instructions. Therefore, findings on the effects of altered writing instructions on emotional processing in the parent study remain inconclusive to this date. Although the approach demonstrates potential for facilitating the expressions of certain emotional states, the question of what emotional states these instructions elicit and to what extent remains unclear. Based on these observations, in the current study, it was hypothesized that participants' emotional processing profiles will be inconsistent with those that the writing instructions were originally designed to promote.

***Preliminary findings on in-session emotional responses during expressive writing.*** In a different arm of the parent study, Morrison (2013) demonstrated that participants who wrote expressively about their experiences of a traumatic event experienced an increase in negative mood immediately following the writing session. Interestingly, this effect seemed to decrease over the course of the three writing sessions: Participants experienced less increase in negative affect at each additional writing session. Sloan and Marx (2004) demonstrated similar findings using participants' salivary cortisol level as a physiological index of emotional reactivity. In their study, participants who

wrote expressively showed an increase in their salivary cortisol levels following the first

writing session, but did not differ from their control counterparts in their cortisol levels

during the subsequent two sessions. These findings seem to align with the exposure-

based theory of emotional processing, which proposes that repeated exposure to the

trauma material facilitates habituation and reduces participants' distress response to the

traumatic material over treatment sessions (Foa & Kozak, 1986). Within this framework,

several studies have demonstrated that patients with PTSD become less responsive,

emotionally and physiologically, to personally traumatic contents after repeated exposure

(e.g. Jaycox, Foa, & Morral, 1998). Other studies have also demonstrated that attention to

emotional processing is reduced as a result of habituation (e.g., Feinstein et al., 2002). In

light of this evidence and the results from a recent unpublished work by Pascual-Leone,

Morrison, and Yeryomenko (2014), expressive writing is presumed to be the most

emotionally impactful and thus most likely to promote the largest extent of emotional

processing during the first writing session. Therefore, the current study utilized the

narrative sample from participants' first session out of the three writing sessions that

occurred in the parent study.

   ***Cluster analysis based on Pascual-Leone and Greenberg's emotional***

***processing profiles.*** Recently, Harrington (2012) utilized archival data and applied the

state-transitional model of emotional processing to explore the written narratives from

180 undergraduate students who wrote expressively about a past stressful event or life

upheaval. The investigator found that, while there was a weak or no relationship between

the original writing instructions and participants' expressions of specific emotional states,

the same six key emotional states were able to be identified by the model in this sample

of written narratives. These emotional states are, in the order of the levels of processing from undifferentiated distress towards personal resolution, global distress, fear/shame, rejecting anger, hurt/grief, self-compassion, and assertive anger. Further, Harrington identified three clusters or styles of emotional processing in participants' narratives. The first cluster, that he labelled the *functional control group*, did not express any emotions in their writing. The second cluster, the *distressed group*, expressed various combinations of early expressions of distress (i.e., global distress, fear/shame, and rejecting anger) but no advanced meaning-making states (i.e., self-compassion, assertive anger, and hurt/grief). The third cluster, the *emotional processing group*, expressed various combinations of both early and advanced emotional states, with the lower rates of early expressions of distress being expressed compared to those in the aforementioned distressed group.

Interestingly, the three clusters found in Harrington's study shared characteristics with those found in a study involving a clinical sample (Pascual-Leone, 2005). In his study, Pascual-Leone coded videotaped psychotherapy sessions and identified four clusters based on the emotional processing model (Pascual-Leone & Greenberg, 2007): (a) *Distressed group,* (b) *protester group,* (c) *fearful and ashamed group,* and (d) *minimally distressed/focused group*. Most relevant to Harrington's study, the distressed group and the minimally distressed/focused group were functionally similar to Pascual-Leone's distressed group and the emotional processing group, respectively. In both studies, the distressed group exhibited a high prevalence of global distress, followed by a lower prevalence of fear/shame and rejecting anger. Further, both the emotional processing group in Harrington's study and the minimally distressed/focused group in Pascual-Leone's study exhibited a lower rate of these early expressions of distress

compared to the distressed group. The overlap, although only partial, provides further support for the utility of Pascual-Leone and Greenberg's model of emotional processing to explore change processes in various populations (i.e., subclinical vs. clinical) and intervention methods (i.e., expressive writing vs. psychotherapy). More specifically, the model seems to hold promise in its capacity to identify successful emotional processing that occurs during expressive writing and facilitates subsequent emotional development. Based on these promising findings, the state-transitional was used as a theoretical framework in the current study to explore: (a) Whether participants differ in their emotional processing profiles, and (b) whether participants' emotional processing profiles are differentially associated with the extent of emotional development observed following an expressive writing task.

   ***Relationship between emotional processing profiles and psychological outcome.*** Although Harrington (2012) found that participants' emotional processing profiles could successfully be grouped into clusters, those clusters did not predict participants' psychological outcome. Assuming there may indeed be a relationship between emotional processing groups and outcome, there are at least two possible reasons for the non-significant findings. The first is simply a limited sample size, and any replication of the study should increase the sample size. While Harrington's sample of 110 is noteworthy, the parent study (Pascual-Leone et al, 2011) now offered a sample of over 250. The second possible explanation is that while participants in the parent study (Pascual-Leone et al., 2011) expressively wrote over three consecutive days, Harrington (2012) used the narrative sample from the third of these three sessions to conduct his analyses. As suggested earlier, conceivably, in Harrington's study, the repeated exposure to the

traumatic content through the two prior writing sessions might have dampened the effects of emotional processing simply because participants had habituated to the task by the time they returned for the third writing session. The absence of the relationship between process and outcome in Harrington's study, therefore, might be due to a limitation in the methodology rather than to the limitation of in-session emotional processes to predict subsequent emotional change.

**Hypothesis.**

*Hypothesis 1: Participants may be grouped based on their emotional processing profiles.* Harrington (2012) applied the state-transitional model of emotional processing (Pascual-Leone & Greenberg, 2007) to explore emotional processing in an expressive writing task. The investigator further conducted a cluster analysis and demonstrated that three groups of processing styles emerged in this narrative sample. Building on this earlier work, one aim of the current study was to explore whether participants may be classified into distinct groups or clusters based on their shared emotional processing profiles. Keeping in line with Harrington's methodology, the Classification of Affective-Meaning States-modified (Pascual-Leone & Greenberg, 2005; Harrington, 2012), an observational measure designed after the state-transitional model, was used to code the presence or absence of the key emotional states. The seven key emotional states that were coded were: Global distress, fear/shame, rejecting anger, hurt/grief, assertive anger, self-compassion, and resolution. Exploring participants' emotional processing profiles within the framework of the state-transitional model also served to further examine the utility of this model in examining emotional processing in the context of expressive writing.

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***Hypothesis 2: There is no relationship between original writing instructions and participants' emotional processing profiles.*** To date, it is unclear whether altering writing instructions enhances the types of emotional processing that they specifically target to enhance (e.g., Lu & Santon, 2010; Nazanian & Smyth, 2013). Most relevant to the current study, Harrington (2012) found that there was no to weak correlation between the original writing instructions and participants' emotional processing in the written narratives from a different writing session that occurred as a part of the same parent study (Pascual-Leone et al., 2011). In light of these findings, in the current study, it was hypothesized that there is no relationship between the original writing instructions and participants' emotional processing profiles. Although I acknowledge that this hypothesis sought to demonstrate a null finding and was not considered a strong statistical test, it was nonetheless important to test whether the null finding from Harrington's study (2012) could be replicated and, more generally, the hypothesis testing contributed to elucidating some of the important findings on participants' emotional experiences in expressive writing in the current study.

***Hypothesis 3: Emotional processing profiles predict short-term and long-term emotional development.*** The state-transitional model was applied to identify in the narrative sample the presence of early expressions of distress (i.e., global distress, fear/shame, and rejecting anger) and advanced meaning-making states (i.e., assertive anger, self-compassion, hurt/grief, and resolution), the latter of which were thought to facilitate psychological well-being. Several studies employed this model in studying emotional processing within the context of psychotherapy and demonstrated that, while early expressions of distress were observed in all cases, only advanced meaning-making

states were predictive of successful outcome (e.g., Pascual-Leone & Greenberg, 2007). Conceivably, a similar link might exist between participants' emotional processing profile in an expressive writing task and their subsequent emotional well-being. In the current study, one aim was to examine this issue by exploring the relationship between different clusters of emotional processing profiles and psychological outcome. On the basis that the model is presumed to be capable of identifying distinct emotional processing profiles and that clusters could be identified based on these processing profiles, it was hypothesized that participants' cluster memberships are differentially associated with improvements in psychological well-being over 17 days (post-intervention; short-term) and 31 days (follow-up; long-term) following the first session of the three-day expressive writing paradigm.

*Hypothesis 4: Participants' emotional processing profiles change across writing sessions.* Recent work by Pascual-Leone, Morrison, and Yeryomenko (2014) revealed that participants experienced an in-session increase in negative affect, but this increase seemed to attenuate over the course of the three writing sessions. The investigators speculated that expressive writing is the most emotionally-evocative and thus most likely to promote emotional processing in the first among the three sessions. Indeed, these findings are in line with the exposure-based theories, proposing that participants' reactive stress decreases due to the repeated exposure to the traumatic material by means of habituation. In light of these considerations, participants' emotional processing profiles could conceivably change across the three writing sessions. Thus, an exploratory hypothesis was established to consider whether participants' cluster memberships will change between their first and third writing sessions. The results of the cluster analysis in

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the current study were directly compared to those coded in Harrington's 2012 study in order to examine this issue.

CHAPTER II

Method

**Participant (From Archival Data; Pascual-Leone et al., 2011)**

The sample consisted of $N = 255$ undergraduate students who volunteered through the undergraduate psychology participant pool as part of a larger study which occurred over a period of two and a half years at the University of Windsor (Pascual-Leone et al., 2011). Although the original study consisted of $N = 260$ participants, five participants did not complete the writing task on the first visit and thus were excluded from this study. The resulting sample was mainly female (87.8%). Approximately half was single (53.7%) followed in frequency by partnered but unmarried (33.7%). 48.2% was employed at the time the study was conducted. 57.6% identified as white/Caucasian, followed by 12.9% African Canadian, 9.4% South Asian, 5.5% Arab/Middle Eastern, 3.5% East Asian, and 3.1% Hispanic/Latino. Eighteen participants (7.1%) were of other ethnic backgrounds. 18.8% of the sample was in the first year of their undergraduate program, while approximately one third of the sample was in the second year (28.2%), and another third in the third year (28.6%), and finally, 22.7% in the fourth year or beyond. Four participants (1.6%) identified themselves to be "Other" to indicate their year of enrolment at the university.

Participants were recruited through the participant pool on the bases of their positively endorsing the following two questions: (a) "Have you suffered a stressful or upsetting event, crisis, or personal upheaval?" and (b) "Do you still have unresolved bad feelings about what happened?" Approximately half (49.4%) of the participants reported that they thought about the traumatic event at least three to four times a week. 25.5%

reported that they thought about it daily. Approximately half (43.9%) rated the traumatic

event as 7 (extremely upsetting) on a seven-point Likert scale; further, 26.7% rated it as 6

(very upsetting). Finally, 31.8% reported that they have received therapy or counseling

while 13.3% reported that they received psychopharmacological treatment specifically to

help address their psychological struggles related to the traumatic event.

**Measures**

      **Outcome measures (from archival data; Pascual-Leone et al., 2011).** A battery

of self-report measures was administered in the parent study by Pascual-Leone et al.

(2011) at three time points: at baseline (i.e., prior to the first expressive writing task),

post-intervention (i.e., 17 days after), and follow-up (i.e., 31 days after). The seven

measures examined in the current study were: the Resolution Scale-Modified (RS-M;

based on Singh, 1994), the Anger Rumination Scale (ARS; Sukhodolsky & Cromwell,

2001), the Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997), the State-

Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983),

the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), the

Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996;

Cann et al., 2010), and the Center for Epidemiologic Studies Depression Scale (CES-D;

Radloff, 1977). These measures were administered to assess participants' emotional

functioning both generally and in relation to their traumatic event, and were used in the

current study to be the indexes of participants' psychological well-being at the baseline

and at the two time points following the expressive writing task. The two additional

measures administered in the parent study but not part of this proposed research were: the

Current Assessment of Somatic Symptoms Inventory (CASSI; Sirois & Gick, 2002) and

a 2-item global heath ratings measure. These two measures are designed to assess health-related behaviours, rather than psychological functioning, and thus were not included in this study.

*The Resolution Scale-Modified (RS-M; based on Singh, 1994).* Based on the original RS that was designed as an outcome measure of psychotherapy, the RS-M is a self-report measure designed to assess participants' subjective sense of resolution about a past interpersonal conflict. Participants rate the extent to which they agree with each of the 12 statements on a six-point Likert scale, ranging from *not at all* to *very much*. In the parent study, the 12 items were modified to capture issues or concern relating to the trauma, rather than issues specifically related to a significant other. The modified items included: "I feel frustrated about not having my needs met *regarding this issue*" and "I feel unable to let go of my unresolved feelings *regarding this issue*." The internal consistency coefficients for the original RS was found to be $\alpha = .82$ (Paivio & Nieuwenhuis, 2001).

*The Anger Rumination Scale (ARS; Sukhodolsky, Golub, & Cromwell, 2001).* The ARS is a self-report measure designed to assess the extent to which participants attend to their own angry moods, recall past anger episodes, and engage in ruminations or fantasies about the causes and consequences of their anger episodes. Participants rate the extent to which they experience each of the 19 statements on a four-point Likert scale, ranging from *almost never* to *almost always.* Statements include: "When something makes me angry, I turn this matter over and over again in my mind", and "I ponder about the injustices that have been done to me". Higher scores indicate greater levels of angry

rumination. The internal consistency coefficient was found to be $\alpha = .93$ (Sukhodolsky, Golub, & Cromwell, 2001).

*The Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997).* The IES-R is a self-report measure designed to assess current distress to a specific past life event. Although the measure is not a diagnostic tool, it includes three subscales that assess the DSM-IV symptom clusters of intrusion, avoidance, and hyperarousal. Participants rate the extent to which they have experienced distress in relation to each of the 22 statements in the past seven days on a five-point Likert scale, ranging from *not at all* to *extremely*. Statements include: "I had waves of strong feelings about it" and "I tried not to think about it." The internal consistency coefficients have ranged from $\alpha = .87$ to .92 for the intrusion subscale, from $\alpha = .84$ to .86 for the avoidance subscale, and from $\alpha = .79$ to .90 for the hyperarousal subscale (Weiss & Marmar, 1997; Briere, 1997).

*The State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983).* The STAI is a self-report measure designed to assess trait anxiety, a type of anxiety thought to be chronic and pervasive as part of a personality trait, and state anxiety, a more contextual and temporal type of anxiety. In this study, only the trait portion of the measure was used. Participants rate the frequency at which they experience each of the 20 statements on a four-point Likert scale, ranging from *almost never* to *almost always.* Statements include: "I worry too much over something that really doesn't matter" and "I feel nervous and restless". In order to accurately reflect participants' temporal experience of anxiety at different time points, the instruction was modified in the parent study so that participants rated how they have been feeling in "the past two

weeks" instead of how they "generally feel". The internal consistency coefficients for the scale have ranged from α= .86 to .95 (Spielberger, et al., 1983).

*The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985).* The SWLS is a self-report measure designed to assess the extent to which participants endorse being satisfied with their lives. Participants rate the extent to which they agree or disagree with each of the 5 statements on a seven-point Likert scale, ranging from *strongly disagree* to *strongly agree.* Statements include: "In most ways my life is close to my ideal". Higher scores indicate greater levels of life satisfaction. The Cronbach's alpha for SWLS in a sample of undergraduate students was found to be 0.79 (Zawawi & Hamaideh, 2009).

*The Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010).* The PTGI-SF is a self-report measure designed to assess the extent to which participants identify as having changed as a result of a stressful life event. Participants rate the extent to which they endorse each of the 10 items on a six-point Likert scale, ranging from "*I did not experience this change as a result of my crisis*" to "*I experienced this change to a very great degree as a result of my crisis*". The measure includes five domains with regards to which participants perceive themselves to have changed: Relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. There are two items that assess each of these five change domains. Statements include: "I changed my priorities about what is important in my life" and "I leaned a great deal about how wonderful people are". Higher scores indicate greater levels of change. The internal consistency coefficient for the scale was found to be α= .89 (Cann et al., 2010).

***The Center for Epidemiologic Studies Short Depression Scale (CES-D; Radloff, 1977).*** The CES-D is a self-report measure designed to assess the extent to which participants experience depressed mood. Participants rate the frequency at which they have experienced each of the 10 statements during the past week on a four-point Likert scale, ranging from *rarely or none of the time (less than 1 day)* to *most or all of the time (5-7 days).* Statements include: "I felt depressed". Higher scores indicate greater levels of depressed mood. The internal consistency coefficient was found to be Cronbach's $\alpha = .86$ (LaChapelle & Alfano, 2005).

**Process measure.** One process measure was used to code emotional states using observational criteria. This procedure generated a new and secondary data set of participants' emotional processing profiles to be analyzed. This sub-section describes the measure used and how it was modified for application to written text.

***The Classification of Affective-Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2007).*** The original CAMS, derived from Pascual-Leone and Greenberg's model of emotional processing, is an observational measure that has been used to identify emotional states in videotaped psychotherapy and predict in-session psychotherapy process and outcome. The CAMS includes three subscales, emotional tone, involvement, and meaning, that inform the presence of each emotional state during psychotherapy sessions. In a recent study by Harrington (2012), the criterion for involvement was modified in order to suit the coding of written text. Using this modified version (CAMS-M), the investigator successfully identified the same key emotional states in the written trauma narratives as those found in the videotaped sessions of psychotherapy. The emotional states coded using this tool were: Global distress,

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fear/shame, rejecting anger, assertive anger, self-compassion, and hurt/grief. In the current study, two trained raters used the CAMS-M to code the 255 written narratives for the presence vs. absence (binary-coded) of each of these six emotional states and one additional emotional state that was included in the original CAMS, namely, resolution. Therefore, there were seven emotional states to be coded in total. Inter-rater reliability coefficients ranged from .76 to .86 Kappa (Pascual-Leone & Greenberg, 2007; Singh, 2011) in coding video-taped therapy sessions. The inter-rater agreement on the emotional profiles of the narratives using the CAMS-M was shown to be at 80% agreement (Harrington, 2012).

*Rating procedure for the CAMS-M.* The CAMS-M coding was conducted only on the narratives from the first visit. Two raters each coded 170 or 171 narratives, resulting in a 33.7 % reliability sample. Prior to the study, the raters completed 15 hours of training that included: Reading the original CAMS manual and related literature (i.e., Pascual-Leone, 2005; Pascual-Leone & Greenberg, 2007), studying video and transcript examples of prototypical CAMS codes, and practicing with a group of expert raters (i.e., Pascual-Leone; Harrington), as well as independently coding 40 practice narratives. During data collection, raters met after each set of 25 narratives to discuss any discrepancies and prevent against observer drift. Raters also consulted regularly with the expert raters to ensure adherence to the coding guidelines. During all phases of data collection, raters were blind to the original experimental design of the parent study and to participants' outcomes.

The aim of the study was to explore whether participants differ in their emotional processing profiles during an expressive writing task. Keeping in line with this goal,

inter-rater reliability was established based on the overall agreement between the two raters on the presence vs. absence of the set of seven emotional states within one narrative as a unit, rather than on a point-by-point agreement for each single emotional state within the narrative. It follows that the inter-rater reliability was calculated based on a profile of emotion codes representing the participant (rather than individual codes). The reason for this was so that the index of reliability matched to level of analysis being used, which was the overall profile of a given participant, represented by the permutations (presence vs absence) across seven emotion codes. Thus, reliability was calculated using the number of emotions agreed/7.

**Procedure for Data Collection in the Parent Study**

In the parent study by Pascual-Leone and colleagues (2011), participants completed a battery of self-report measures as discussed earlier, prior to the first expressive writing task. Participants were then instructed to write for 15 minutes each session, one session per day, over three consecutive days. During each writing session, participants were given one of the five writing instructions that corresponded with their assigned control or experimental conditions, as illustrated in Table 1. In the task control condition, participants were instructed to write a non-emotional account of what they did over the previous 24 hours. In the active control condition, which was analogous to the writing condition in the original expressive writing study by Pennebaker and Beal (1986), participants were instructed to write about their "deepest thoughts and feelings" about their trauma. Three experimental conditions were implemented, each designed to direct participants to write about different and specific sets of emotional states. In the venting writing condition, participants were instructed to write about feelings that corresponded

with early expressions of distress as described by Pascual-Leone and Greenberg's emotional processing model (2007). Conversely, participants in the meaning-making condition were instructed to write about feelings that corresponded with advanced meaning-making states. Finally, participants in the sequential processing condition were instructed to write about different emotions over the three writing sessions. On the first day, participants in this group received the same instruction as those in the venting writing condition (i.e., to write about feelings that corresponded with early expressions of distress).

Data from the first among the three visits was coded and analyzed in the current study to explore participants' emotional processing profiles and their possible associations with psychological outcome. Each visit consisted of 1 to 6 participants in a quiet lab room, and all writing was done on individually partitioned computers. At fourth and fifth sessions, that occurred respectively 17 and 31 days following the first writing session, participants again completed the self-report outcome measures. At the end of the study, participants were fully debriefed, received information regarding on-campus mental health resources, and were compensated with 3 undergraduate course points in addition to the payment of $35.

**Data Analysis**

**Testing hypothesis 1.** A two-step hierarchical cluster analysis was conducted to explore whether participants may be categorized on the basis of the emotional states they expressed (i.e., emotional processing profiles). The seven emotional states as identified by the CAMS-M served as the clustering variables. Each binary response was dummy coded in the following manner: presence = 1, absence = -1. Log-likelihood was used as

the distance measure, and the Bayesian Criterion was used as the clustering criterion. In the two-step algorithm, first, all cases were grouped into pre-clusters based on their similarities in expressing the seven emotional states. Second, hierarchical clustering was used to match the pre-clusters one by one, based on their similarities in expressing the emotional states.

**Testing hypothesis 2.** A chi-square test was conducted to explore whether participants from the five writing conditions differentially expressed the seven CAMS-M emotional states. The expected frequency values consisted of the participants' membership to each of the original writing conditions. Since two of the 5 original conditions, the venting writing condition and the sequential processing condition, received the identical instructions on Visit 1, the two conditions were grouped together, resulting in 4 condition groups. The observed frequency values consisted of the participants' membership to the cluster groups that were identified through testing the previous hypothesis; that is, these clusters served to indicate the emotional states about which participants actually wrote, regardless of the original writing conditions to which they belonged. In sum, the chi-square test was conducted on the 4 (original writing condition) by the number of clusters (cluster groups) matrix to compare the original writing conditions against the number of emotional-processing groups, or clusters, observed in the actual data.

**Testing hypothesis 3.** A repeated measures multivariate analysis of variance was performed with the cluster groups (determined by the testing of hypothesis 1) as the between-subject factor and the three time points at which the battery of psychological measures were administered (i.e., at baseline, post-intervention at the 17 days, and

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follow-up at 31 days following the baseline) as the within subject factor. Participants'

scores on the seven psychological measures served as the dependent variables.  The

repeated measures design was therefore based upon the number of clusters (cluster

groups) by 3 (time points). The aim was to determine whether cluster membership was

associated differentially with participants' scores on the psychological outcome measures

over the course of 17 and 31 days following the first expressive writing intervention.

**Testing hypothesis 4.** Participants' cluster memberships from the first session

and from the third session were compared to explore what fraction of participants

changed their emotional processing profiles over the writing sessions. A total of 110

participants' cluster memberships during the first session (as determined in the test for

hypothesis 1) were compared to those identified and available from the previous study by

Harrington (2012).

CHAPTER III

Results

**CAMS-M Coding Reliability**

The Classification of Affective-Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2005, Harrington, 2012) was used to code in a binary manner the presence vs. absence of seven key emotional states as described in the method section. Inter-rater reliability was established on the bases of the total number of emotional states upon which the two raters agreed out of the seven possible emotional states, rather than on a point-by-point agreement on each single emotional state, per narrative. Briefly reiterating on this point, the objective of coding with the CAMS-M was to systematically describe participants' emotional experiences as captured in their narratives: Thus, it was more important to establish the extent to which the raters reliably coded the narratives as wholes, rather than upon single emotional state. To provide a comparison against chance occurrence, the nested probability that the two raters completely agree on a narrative is 0.8% (i.e., 0.5 random chance occurrence to the power of 7), making it highly unlikely that the two raters achieve a 100% agreement by chance.

In the current study, inter-rater percent agreement established through the aforementioned method ranged from 42.9% to 100%, with the average agreement at 89%. Disagreements in coding were resolved by the two raters and the resulting codes were included in the analyses.

**Hypothesis 1: Participants May be Grouped Based on Their Emotional Processing**

**Profiles**

A two-step hierarchical cluster analysis was performed using the seven emotional states identified with the CAMS-M: Global distress, fear/shame, rejecting anger, hurt/grief, self-compassion, assertive anger, and resolution. Log-likelihood was used as a distance measure to quantify similarity, and the Bayesian information Criterion (BIC) was used as the clustering criterion. The analysis revealed that there were three naturally occurring clusters at the Silhouette measure of cohesion and separation = 0.4, indicating fair cluster quality. The ratio of the largest to the smallest clusters was 1.59:1 ($n = 102$, $n = 89$, and $n = 64$). The relative importance of the seven emotional states for clustering, in the order from the most to the least important, are: Global distress, hurt/grief, fear/shame, self-compassion, rejecting anger, assertive anger, and resolution.

The first cluster was composed of $n = 102$ participants (40% of the sample). None of the participants in this cluster expressed any of advanced meaning-making states (i.e., hurt/grief, self-compassion, and assertive anger), with the exception of 2 codes of resolution. 91.2% of the participants expressed global distress, followed by 56.9% expressing fear/shame, and 50% expressing rejecting anger. Based on these observations, this cluster was labeled as the "distressed group".

The second cluster was composed of $n = 89$ participants (34.9% of the total sample). Participants in this cluster expressed a mixture of both early expressions of distress and advanced meaning-making states. Specifically, participants expressed moderate levels of early expressions of distress in that 68.5% experienced fear/shame, followed by 53.9% experiencing global distress, and 48.3% experiencing rejecting anger.

However, participants also expressed moderate levels of advanced meaning-making states in that 56.2% expressed hurt/grief, followed by 39.3% expressing self-compassion, and 21.3% expressing assertive anger. Two codes of resolution were also found in this cluster. Based on these observations, this cluster was labeled as the "distressed and meaning-making group".

Finally, the third cluster was composed of $n = 64$ participants (25.1% of the sample). None of the participants in this cluster expressed any emotions with the exception of one code of assertive anger. That is, no participant in this group expressed global distress, fear/shame, rejecting anger, hurt/grief, self-compassion, and resolution. Based on these observations, this cluster was labeled as the "non-emotional group".

Overall, the hypothesis that participants may be grouped based on their emotional processing profiles was supported.

**Hypothesis 2: There is No Relationship between Original Writing Instructions and Participants' Emotional Processing Profiles**

A chi-square test of independence was performed to evaluate whether participants who received different writing instructions differ in their emotional processing profiles as coded by the CAMS-M. Two of the original five writing conditions were combined into one cell because participants in these conditions received the identical set of instructions on the first visit. Participants in the task control writing condition, who were instructed to write a non-emotional account of their previous 24 hours, were excluded from the analysis. This was because the hypothesis was aimed at evaluating whether participants wrote about their emotional experiences of trauma differently based on the different writing instructions they received; thus, the task control writing condition, in which

participants were specifically instructed *not* to write about the trauma or about any emotion, was not relevant to this analysis. Indeed, 50 of the 51 participants in this condition belonged to the cluster group that expressed *no* emotion. Similarly, the "non-emotional group" of the three post-hoc cluster groups was also excluded, as the participants in this cluster group did not provide any emotional experience that could be systematically examined.

It follows that the chi-square test was performed on the 3 (condition) by 2 (cluster) cross tabulation. The independence of observation assumption was met in that participants completed the study independently on partitioned computers. The sample size was deemed adequate (i.e., $n > 5$ per cell). The analysis revealed non-significance. The hypothesis was supported: Participants did not follow the writing instructions in that they did not differ in their emotional processing profiles as would have been expected on the basis of the instructions they received. Again, this hypothesis was aimed to establish a null finding which is considered a less robust statistical analysis. Testing this hypothesis was nonetheless crucial in: (a) Elucidating the importance of the findings from the current analyses that describe the ways in which emotional processing during expressive writing may be linked to emotional development, and (b) exploring whether Harrington's null findings that participants on Visit 3 did not follow their writing instructions may be replicated in the current dataset from Visit 1.

**Hypothesis 3: Emotional Processing Profiles Predict Short-term and Long-term Emotional Development**

Prior to testing this hypothesis, 14 participants (5.5% of the sample) who did not complete the outcome measures at the baseline, post-intervention, or follow-up were

removed. Further, three participants each did not have a score on one of the outcome measures on one occasion: One participant did not have the score on the Anger Rumination Scale (ARS; Sukhodolsky & Cromwell, 2001) at the baseline; another participant did not have a score on the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) at the baseline; and lastly, one participant did not have a score on the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) at post-intervention. Little's Missing Completely at Random Test (MCAR test; Little, 1988) was conducted on the entire sample and revealed non-significance, indicating that data was missing at random.

The single-point missing data for the three cases were replaced by imputing the mean score of all participants' scores on the particular outcome measure for which each case had a missing score. A visual inspection of the means and standard deviations between the original data and the data containing the imputed means in the places of the missing data revealed that they were not significantly different (i.e., means differed within the range of the second decimal point whilst standard deviations were higher in the original data up to .12). Further, analyses were run on the two data sets and revealed an analogous pattern of significance testing results. On the basis of these observations, the subsequent analyses were run on the data set with the imputed means in place of the three single-point missing data, with $N = 241$ participants. The mean and standard deviations of participants' scores on the seven outcome measures per the three cluster groups are shown in Table 2.

A 3 (emotional processing cluster) by 3 (time: baseline, post-intervention, follow-up) multivariate analysis of variance (MANOVA) for repeated measures was performed

to investigate the influence of cluster membership and time across the seven

psychological outcome scores. The seven psychological outcome measures were: the

Resolution Scale-Modified (RS-M; based on Singh, 1994), the Anger Rumination Scale

(ARS; Sukhodolsky & Cromwell, 2001), the Impact of Event Scale-Revised (IES-R;

Weiss & Marmar, 1997), the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch,

Lushene,Vagg, & Jacobs, 1983), the Satisfaction with Life Scale (SWLS; Diener,

Emmons, Larsen, & Griffin, 1985), the Post-Traumatic Growth Inventory-Short Form

(PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010), and the Center for

Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The seven

psychological outcome measures are mostly correlated amongst themselves as illustrated

in Table 3.

     **Assumptions.** Prior to conducting the repeated measures MANOVA, the relevant

assumptions were tested. In reference to the sample size, Harris (1985) suggests that

given five or fewer predictors, the number of participants should exceed the number of

predictors by at least 50. Moreover, Tabachnick and Fidell (1996) suggest that every cell

size must have more cases than the number of dependent variables when using the

MANOVA. Given that the present analysis included $N = 241$ participants, with the

smallest number of participants per cell at $n = 61$, while including two predictors (i.e.,

cluster membership and time) and seven dependent variables (i.e., the seven

psychological outcome measures), the sample size was deemed adequate.

     The Shapiro-Wilk tests of univariate normality revealed that the dependent

variables were not normally distributed. Given that univariate normality is a pre-requisite

of multivariate normality, along with a critical observation of the bivariate scatterplots on

each pair of dependent variables, the findings suggested that multivariate normality was not tenable.

The Levene's test revealed univariate homogeneity of variance in all dependent variables with the exception of the baseline scores on the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and the post-intervention scores on the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983). The Box's M test revealed that the variance-covariance matrices across the dependent variables at each level of the cluster membership were homogenous at $p = 0.060$. However, it is important to note that the dataset without the replacement of the three missing values with the imputed mean scores violated this assumption at $p = 0.038$. These findings are perhaps not surprising, as Box's M is highly sensitive to non-normality (Stevens, 2009).

Stevens (2009) suggests that $F$ statistic is robust against Type 1 error in that the multivariate normal vs. non-normal sampling distribution of F was affected only within α of 0.02 at the significance levels of $α = 0.05$ or $α = 0.1$. This said, given that the present data violated the assumptions of multivariate normality, a more stringent significance level should be used in interpreting the significance tests, and caution should be taken when inferring from the results of this hypothesis testing.

**Main analysis.** The repeated measures MANOVA revealed that there was no interaction: Participants in different clusters did not differ in the way they improved their psychological well-being as assessed by the seven psychological outcome measures over the three time points. The hypothesis that emotional processing profiles predict emotional development was not supported.

All participants improved their overall psychological well-being across the three time points at the baseline, post-intervention, and follow-up, Wilk's $\Lambda$ = .482, $F$ (14, 225) = 17.276, $p$ < .001. The effect size was $\eta^2_p$ = .518. This effect of time was large and accounted for over 50% of the variance observed in the combined psychological outcome scores.

Further, participants in the "distressed," "distressed and meaning-making," and "non-emotional" cluster groups differed in their overall scores on the combined seven psychological outcome measures, Wilk's $\Lambda$ = .887, $F$ (14, 464) = 2.055, $p$ = .013. The effect size was $\eta^2_p$ = .058. This effect of cluster groups was small and accounted for 5.8% of the variance observed in the combined psychological outcome scores.

***Post-hoc ANOVA analyses.*** Seven separate ANOVAs were performed to further discern the main effect of time. Participants experienced a reduction in emotional distress over time on all psychological measures at $p$ < .001 with the exception of the Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010) as illustrated in Table 4. Further, participants reported a linear decrease in anxiety, anger, depressed mood, and negative psychological impact of the traumatic event, with a linear increase in life satisfaction, and a quadratic increase in personal resolution, over the 31-day period.

***Post-hoc discriminant function analysis.*** In order to further analyze the main effect of cluster membership, a discriminant function analysis (DFA) was performed to evaluate whether cluster membership may be discriminated on the basis of participants' scores on the various psychological outcome variables. To this end, the Pre, Post, and Follow-up scores were averaged for each of the seven psychological outcome measures

so that each participant had one pooled score for each psychological outcome measure. The seven outcome measures served as the predictor variables to discriminate participants into the three cluster groups. DFA was preferred over seven separate ANOVAs as the method of analysis because: (a) The former is more prudent against Type I error, and (b) multivariate approach such as DFA provides a more sensitive analysis when there are correlations among the outcome variables as previously described and seen in Table 3.

In a test of assumptions for the DFA, a Box's M test revealed non-significance, indicating that the variances among the three clusters are indeed homogenous. Further, the sample size of $N = 241$ was deemed adequate on the basis that it is 20 times larger than the number of predictors ($k = 7$).

The discriminant function analysis yielded two functions (i.e., linear combinations of the seven predictors) which together successfully discriminated participants among the three clusters, Wilk's $\Lambda = .887$, $\chi^2$ (14) = 28.276, $p = .013$. The second function alone did not discriminate participants among the three clusters. The effect sizes for the first and the second functions were obtained by squaring the canonical correlation, $R^2_c = .071$ and $R^2_c = .045$, respectively. Stated another way, the first function accounted for 7.5% of the variance in participants' cluster membership, and the second function accounted for an additional 4.5%. On the basis of the significance testing, only the first function was analyzed in terms of its ability to discriminate participants' membership to the clusters.

The standardized canonical discriminant function coefficients and the structural correlation coefficients were further evaluated for the extent to which each psychological outcome measure contributes to discriminating participants among the three clusters, and

the extent to which each psychological outcome measure correlates with Function 1, respectively. Following the recommendations given by Stevens (2009), the structural correlation coefficients were used to define the nature of the function. The examination of these two variables as well as the group centroids revealed that the first function discriminated among participants in the "distressed group" and the "distressed and meaning-making group," with participants' scores on the Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010),  the Resolution Scale-Modified (RS-M; based on Singh, 1994), and the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983) contributing the most towards this discrimination. Based on these results, the function was defined as the *Post-traumatic Growth composite = 1 (PTGI-SF) + .78 (RS-M) - .48 (STAI).* Relatively higher scores on this function predicted participant's membership to the "distressed and meaning-making group" as opposed to the "distressed group", whilst scores of the "non-emotional group" fell in-between these two extremes. That is, participants in the "distressed and meaning-making group" evidenced relatively higher levels of post-traumatic growth and a sense of resolution, as well as relatively lower levels of anxiety, as opposed to their counterparts in the "distressed group". Participants' mean scores on these three psychological outcome measures per cluster groups are illustrated in Figure 1, Figure 2, and Figure 3.

Overall, these analyses accurately discriminated participants' cluster membership in 48.1% of cases, at the rates of 48.9% for the "distressed group," 45.3% for the "distressed and meaning-making group," and 50.8% for the "non-emotional group." Furthermore, this analysis predicted cluster membership above chance (i.e., 33.3%).

***Summary of the main analyses.*** In sum, although the hypothesis that emotional

processing profiles predict short-term and long-term emotional development was not

supported, all participants improved in their emotional well-being over the 31-day period

(i.e., main effect of time). Further, on the basis of coding with the CAMS-M, participants

who displayed both early expressions of distress and advanced meaning-making states

(i.e., "distressed and meaning-making group") as opposed to those who displayed only

early expressions of distress (i.e., "distressed group") evidenced higher levels of post-

traumatic growth and a sense of resolution and lower levels of anxiety, irrespective of the

passage of time (i.e., main effect of cluster membership).

**Hypothesis 4: Participants' Emotional Processing Profiles Change across Writing**
**Sessions**

Harrington (2012) investigated participants' narratives from Visit 3 of the parent

study (Pascual-Leone et al., 2011) and found three clusters on the basis of participants'

emotional processing profiles. Participants' emotional profiles were determined through

coding of the six emotional states per the Classification of Affective-Meaning States-

modified (CAMS-M; Pascual-Leone & Greenberg, 2005; Harrington, 2012): Global

distress, fear/shame, rejecting anger, hurt/grief, self-compassion, and assertive anger). To

clarify: While Harrington's data used a smaller sample to generate clusters based on data

from Visit 3, the current study generated clusters based on data from Visit 1, two writing

sessions earlier. As one would expect, the three clusters in Harrington's study appear to

be functionally similar to the three clusters derived in the current study. To this end, the

"distressed group" in Harrington's study expressed relatively high levels of early

expressions of distress and no advanced meaning-making states, and is functionally

similar to the "distressed group" in the current study. Another group, which Harrington labeled as the "emotional processing group," expressed some advanced meaning-making states as well as relatively moderate levels of early expressions of distress, as seen in the current study's "distressed and meaning-making group". Lastly, Harrington's sample included a subgroup which he labeled as the "functional control group" that did not express any emotions, and corresponds with the "non-emotional group" as identified in the current study. Based on these observations, the three clusters from Visit 1 as derived in this study and those from Visit 3 which were derived and available from Harrington's were used to explore whether participants' emotional processing profiles changed between the first and the third visit.

A modified 3 (visit 1 cluster) by 3 (visit 3 cluster) chi-square goodness-of-fit test was performed. Because the null hypothesis for this test was that cluster memberships would stay the same across visits (when comparing visits 1 and 3), as opposed to the traditional null hypothesis that cases are being randomly distributed, the test was modified so as to specify the frequencies from Visit 3 as the expected values and those from Visit 1 as the observed values. Given that Harrington (2012) examined narratives from a smaller sample of $N = 110$ participants, this limited the number of cases that could be used and only the corresponding participants were included from the current study. The independence of observation assumption for the chi-square test was met to the extent that participants independently and individually completed the expressive writing paradigm. The assumption for the sample size was also met ($n > 5$ for each cell).

The analysis revealed that, as hypothesized, participants' emotional processing profiles changed between Visit 1 and Visit 3, $\chi^2 (2) = 8.095$, $p = 0.017$, with *Cohen's w =*

0.271, denoting a medium effect size as illustrated in Table 5. The "non-emotional"/"functional control" category contributed the most to the significant finding, at the standardized residual of 2.25 and whereby the group size decreased from $n = 25$ on Visit 1 to $n = 16$ on Visit 3.

Based on a descriptive examination of participants in the distribution, five participants who were in the "non-emotional"/"functional control" category on Visit 1 belonged to the "distressed group" on Visit 3, while five who were in the "non-emotional"/"functional control" category on Visit 1 belonged to the "distressed and meaning-making"/"emotional processing" category on Visit 3. Twenty-two participants who were in the "distressed group" on Visit 1 belonged to the "distressed and meaning-making"/"emotional processing" category on Visit 3. None of the participants who were in the "distressed group" on Visit 1 switched their emotional processing profile to the "non-emotional"/"functional control" category on Visit 3. Last, 14 participants who were in the "distressed and meaning-making"/"emotional processing" category on Visit 1 belonged to the "distressed group" on Visit 3, while one in the "distressed and meaning-making"/"emotional processing" category on Visit 1 belonged to the "non-emotional"/"functional control" category on Visit 3. As well, the relative proportions of participants in the three clusters upon each visit were different. On the one hand, the largest proportion of participants (40%) expressed early expressions of distress alone and belonged to the "distressed group" on the first visit. On the other hand, the largest proportion of participants (46%) expressed both early expressions of distress and advanced meaning-making states and belonged to the "distressed and meaning-making

group" on the third visit. Overall, the hypothesis that participants change their emotional

processing profiles between the first and the third visits was supported.

CHAPTER IV

Discussion

The overall aim of this study was to systematically examine participants'

emotional experience during an expressive writing task within the theoretical framework

of Pascual-Leone and Greenberg's emotional processing model (2007). Pascual-Leone

and Greenberg's operationalization of their model, the Classification of Affective-

Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2005; Harrington,

2012), was applied to code participants' written narratives with the goal to explore

whether writing about qualitatively different emotional states was differentially

associated with the psychological benefits that have been consistently demonstrated to

follow expressive writing (for a review, see Frattaroli, 2006, meta-analysis). In

psychotherapy research, the CAMS has been successfully applied to identify emotional

states that are facilitative vs. not facilitative in terms of improving psychological well-

being and psychotherapy treatment outcome (e.g., Pascual-Leone and Greenberg, 2007;

Pascual-Leone, 2009; Singh, 2008; Kramer, Pascual-Leone, Despland, & de Roten, 2014).

To date, Harrington (2012) was the only study in which the CAMS was applied to code

and explore the same key emotional states in written text. As such, one aim of the current

study was to add to this nascent body of research and explore the validity and utility of

the CAMS as it is applied to code and systematically examine participants' emotional

experiences, or emotional processing profiles, as they appear in written personal

narratives.

**Summary of the Key Findings**

Mixed findings were observed in the current study and will be further discussed in the subsections below. First, participants who wrote emotionally about their past trauma did not follow the writing instructions that were administered in order to enhance the processing of certain sets of emotional states that corresponded with the key components of Pascual-Leone and Greenberg's emotional processing model (2007). The key components of the emotional processing model, however, were able to be identified in participants' actual written text by coding post-hoc with the Classification of Affective-Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2011, Harrington, 2012). Further, there were three distinct, discernable clusters that emerged on the basis of these observed data.

The three post-hoc clusters were used in the subsequent analyses with the aim to explore whether participants' emotional experiences were related to the extent to which they experienced a reduction in emotional distress/improvement in emotional well-being following expressive writing. To this end, all participants were found to experience the psychological benefits of expressive writing in a similar trajectory over the 31-day period, although participants' emotional processing profiles did relate to the overall levels of symptom distress that they experienced. Finally, participants changed their emotional processing profiles between the first to the third writing visit, with the most significant proportion of change observed in participants who switched from writing about early expressions of distress alone on Visit 1 to writing about these emotional states and additionally advanced meaning-making states on Visit 3.

**People Do Not Closely Follow Process Instructions in Expressive Writing**

In the parent study (Pascual-Leone et al., 2011), participants were assigned to one of the five writing conditions and received instructions designed to facilitate their writing about distinct and different sets of emotional states. The actual data, or participants' emotional processing profiles as coded by the Classification of Affective-Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2011, Harrington, 2012), revealed that those who wrote emotionally about their past traumatic events did not write about emotional states that were expected based on their assigned conditions. The finding supports the null hypothesis that there is no link between the writing instructions participants received and the types of emotions about which they actually wrote, and further corresponds with the preliminary findings from Harrington's study (2012) that the relationship between participants' original writing conditions in the parent study and the emotional states observed in participants' narratives on Visit 3 was weak to nonexistent.

Indeed, research to date on the utility of specific writing instructions to facilitate particular emotional processing in expressive writing has yielded mixed results (e.g., Kovac & Range, 2002; Nazarian & Smyth, 2013; Schutte, Searle, Meade & Neill, 2012; Vrielynck, Philippot & Rime, 2010). In this line of inquiry, writing instructions were traditionally modeled to promote theoretically distinct emotional processes with the aim to explore the mechanisms of how expressive writing produces psychological benefits. Nazanian and Smyth (2013) recently demonstrated that writing instructions did not always promote the set of emotional processing that they were designed to, in that these instructions sometimes facilitated the use of a wider range of emotional processing in unexpected ways. The null finding in this study and in Harrington's (2012) seem to

support this notion: Participants do not follow writing instructions in the presumed manners.

Another way to interpret the null finding in the current study may be offered from studying Pascual-Leone and Greenberg's theoretical framework of emotional processing (2007). According to this model, individuals are thought to work through their undifferentiated state of distress towards a sense of personal resolution in a predictable, sequential cyclical pattern through the varying levels of emotional states. Briefly reiterating the emotional states in the order of progression towards personal resolution, these are: Global distress, fear/shame, rejecting anger, hurt/grief, self-compassion, assertive anger, and resolution. The first three emotional states are considered to be early expressions of distress and have been found to have no link with successful therapy outcome (as opposed to the remaining four emotional states of advanced meaning-making states; e.g., Pascual-Leone & Greenberg, 2007).

It follows that, in the context of Pascual-Leone and Greenberg's emotional processing model (2007), individuals are thought to be able to progress to the next stage of emotional processing when and only when they have successfully processed the earlier emotional states. Based on these theoretical premises, at least some participants in the current study and Harrington's (2012) arguably did not follow writing instructions not because they chose not to, but perhaps because they 'could not'. Elaborating on this point, participants who had not processed through early expressions of distress simply may have been unable to write about the higher-order emotional states (e.g., advanced meaning-making states) even if they were instructed to do so in the original meaning-making writing condition. Conversely, participants who readily expressed advanced meaning-

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making states conceivably were capable of and had the option to write about these higher-order emotional states or the lower-order emotional states (i.e., early expressions of distress).

Notably, it was observed that a large proportion of the sample changed their emotional processing profiles between the first and the third visit in a manner that may be expected per Pascual-Leone and Greenberg's emotional processing model. As shown in the results section, those who switched from evidencing high levels of early expressions of distress and no advanced meaning-making states on Visit 1 to expressing moderate levels of both early expressions of distress and advanced meaning-making states on Visit 3 constituted the largest proportion ($n = 22$) of the participants who switched their emotional processing profiles between Visit 1 and Visit 3. Though these findings are descriptive and preliminary, participants conceivably could have been progressing through the levels of emotional states in the subsequent writing sessions, as predicted by Pascual-Leone and Greenberg's theory. Taken together, it is possible that participants did not follow instructions partly on the basis that they entered the expressive writing paradigm with varying levels of emotional experiences that corresponded with the different stages of Pascual-Leone and Greenberg's emotional processing model, which would have enabled or not enabled them to write about the various levels of emotional states as instructed.

**Emotional Processing Profiles were Identified by the CAMS-M**

The seven emotional states, global distress, fear/shame, rejecting anger, hurt/grief, self-compassion, assertive anger, and resolution, were successfully identified through coding participants' narratives with the Classification of Affective-meaning States-

modified (CAMS-M; Pascual-Leone & Greenberg, 2007; Harrington, 2012). These provided the "emotional processing profiles," or otherwise said, an "affective-meaning footprint," of participants' emotional experiences based on their writing about a past upsetting event. Further, three distinct, discernable clusters emerged based on participants' emotional processing profiles. The smallest cluster, the "non-emotional group," consisted of participants who did not express any emotions. The "distressed group," which comprised the largest cluster, consisted of participants who expressed only early expressions of distress and no advanced meaning-making states. Lastly, participants in the "distressed and meaning-making group" expressed both advanced meaning-making states as well as lower levels of early expressions of distress compared to those in the "distressed group". This not only confirmed the hypothesis that participants may be grouped based on their emotional processing profiles, but further serves to support the validity of the CAMS as it is applied to code key emotional states in the written narrative material of traumatic events.

**Post-hoc clusters of emotional processing profiles converge with past research.** The findings that the CAMS-M could be successfully applied to code written narratives to identify distinct emotional processing profiles, and that these profiles may be used to group participants in a meaningful way, replicate the results from Harrington's study (2012). Indeed, the "non-emotional," "distressed," and "distressed and meaning-making" cluster groups found in the current study as previously described, correspond functionally to the three cluster groups, "functional control," "distressed," and "emotional processing" groups, respectively, as observed in Harrington's (2012).

Further, the three cluster groups observed in the current study and in Harrington's (2012) share some characteristics with the findings from Pascual-Leone's cluster analysis (2005). Briefly, Pascual-Leone applied the CAMS to study emotional processing in $N = 34$ clients in emotion-focused psychotherapy and identified four clusters on the basis of the relative proportions of time that clients spent evidencing each of the CAMS emotional states. Most relevantly, the "distressed group" in Pascual-Leone's (2005) corresponds with the "distressed group" in the current study and in Harrington's (2012). Further, the "minimally distressed/focused group" in Pascual-Leone's (2005) shares characteristics that are also observed in the current study's "distressed and meaning-making group" and Harrington's "emotional processing group" (2012).

Taken together, although the overlap is partial, the similarities in cluster characteristics observed in Pascual-Leone's seminal cluster analysis study (2005), in Harrington's study (2012), and finally in the current study, provide some insight into two important questions in emotional processing research. First, the shared characteristics in emotional processing between the sub-clinical samples and the clinical sample may be revealing of some underlying and universal profiles of emotion change when considering individuals' experiences of "working through" their stressful life events, from the overwhelming, undifferentiated states of distress (i.e., global distress, fear/shame, rejecting anger) to more meaning-making states (i.e., hurt/grief, self-compassion, assertive anger) and finally to the end state of personal resolution. Second, the Classification of Affective-Meaning States appears to be a useful tool in capturing these profiles of emotional processing. These promising findings further support the validity of

the CAMS in general as well as add supporting findings for its validity in coding written text.

**Emotional Profiles Do not Predict Emotional Development but Reveal Distress Symptomatology in Expressive Writing**

The hypothesis that emotional processing profiles predict either short-term or long-term emotional development was not supported. Although participants in the three post-hoc clusters differed in their emotional processing profiles, they did not differ in the trajectories through which they improved in emotional well-being over the 31-day period. This finding was especially unexpected in that participants who wrote emotionally about past traumatic events did not differ from their counterparts who did not write about past traumatic events or those who did not write emotionally in subsequent emotional development. This finding is not in line with existing research demonstrating that expressively writing about a past traumatic event increases emotional well-being beyond writing about neutral topics or topics unrelated to the trauma (e.g., see Pennebaker & Beall, 1986 for the seminal study; see Frattaroli, 2006 for a meta-analysis).

Indeed, while many studies have demonstrated psychological gains following expressive writing, the effect size of this intervention has been shown to be small (Peason's $r = .075$, 95% CIs [.051, .098], $N = 10,994$; Frattaroli, 2006). Perhaps due to this, expressive writing has not always been shown to facilitate emotional development, and such a result may be more likely for non-clinical samples. For example, in their study of $N = 87$ widowed community members, Stroebe, Stroebe, Schut, Zech, and van den Bout (2002) observed that participants who presented with uncomplicated grief and who wrote emotionally about their loss did not differ in their subsequent emotional experience

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from their counterparts in the control group who did not engage in any writing. In sum, the small effect size may have partially contributed to the null findings in the current study.

Participants' cluster memberships were differentially associated with their overall ratings of psychological well-being, which were obtained by pooling their scores on the seven psychological outcome measures across the Pre, Post, and Follow-up time points. Participants in the "distressed and meaning-making group" reported relatively higher levels of post-traumatic growth and sense of resolution and relatively lower levels of anxiety as opposed to their counterparts in the "distressed group". It is noted, however, that the *Post-Traumatic Growth composite* that discriminated between the "distressed group" and the "distressed and meaning-making group" on the basis of these three emotional functioning domains accounted for only 7.5% of the variances in participants' cluster memberships. Further, the composite was only moderately accurate in classifying participants' cluster membership at an average of 47.3% accuracy.

Based on these observations, it may be prudent to state that although cluster membership is differentially associated with participants' emotional well-being at a statistically significant level, this link may not be the primary factor in explaining the variability in participants' emotional well-being following expressive writing. This point was indeed illustrated in the larger effect size obtained for the main effect of time ($\eta^2_p$ = .521) as opposed to that of cluster membership ($\eta^2_p$ = .060), as will be discussed in the next section.

Despite these limitations, it is noteworthy that participants in the "distressed and meaning-making group" and the "distressed group" differed on three theoretically related

domains of emotional well-being. Specifically, the former evidenced higher levels of

post-traumatic growth and a sense of resolution as well as lower levels of anxiety

compared to their counterparts in the "distressed group". Post-traumatic growth and

personal resolution are intrinsically related functions that specifically address individuals'

emotional experiences in relation to a past traumatic or upsetting event. Further, anxiety

is a well-established symptom of post-traumatic stress experiences, both clinically and

sub-clinically (e.g., Beck, Jacobs-Lentz, Jones, Olsen, & Clapp, 2014). Taken together,

these findings may provide important implications for understanding emotional

experiences that occur post-trauma, and perhaps more specifically, post-traumatic

symptomatology that is reflected in the way individuals write about their experiences of

trauma. To this end, it is also important to recognize that the Classification of Affective-

Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2007; Harrington,

2012) was the tool used to generate the data of participants' emotional processing profiles

and upon which the post-hoc clusters emerged. This suggests that the CAMS may be

especially sensitive to detecting individual differences in the aforementioned domains of

emotional well-being – post-traumatic growth, sense of resolution, and anxiety – or at

least specifically in scores of the three measures that were used in the current study to

assess these domains, namely, the Post-Traumatic Growth Inventory-Short Form (PTGI-

SF; Tedeschi & Calhoun, 1996; Cann et al., 2010), the Resolution Scale-Modified (RS-

M; based on Singh, 1994), and the State-Trait Anxiety Inventory (STAI; Spielberger,

Gorsuch, Lushene,Vagg, & Jacobs, 1983). The finding provides evidence that an

individual's emotional experiences in these domains are able to be predicted simply from

rating his or her personal narrative on the CAMS.

Taken together, the findings seem to suggest that: (a) Participants' levels of emotional distress as observable in their personal narratives of an upsetting event are particularly related to their experiences of post-traumatic growth, sense of resolution, and anxiety, and (b) the CAMS coding of a personal narrative is revealing of these individual differences in symptom distress in the context of post-traumatic emotional functioning.

**Participants Expressed Less Distress over Time**

Participants experienced positive change over the 31-day period on six of the seven measures used: Participants experienced a reduction in anxiety, anger, depressed mood, and negative psychological impact of the traumatic event, and an increase in life satisfaction and personal resolution. Post-traumatic growth was the only index on which participants did not show improvement over time. The finding that participants' level of emotional well-being generally improved over the Pre, Post, and Follow-up time points is perhaps expected in light of the known phenomenon that people who have experienced an upsetting event generally and naturally tend to feel better with the passage of time. Participants in the current study had experienced an upsetting event in the past, irrespective of their writing conditions nor their post-hoc cluster membership, as identified through their self-reports at the recruitment stage. The healing effect of time, therefore, is a generalized, naturally-occurring factor that likely compounded the current study's research design.

The Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010) was the single variable on which participants did not improve over time. It is speculated that the underlying post-trauma related thoughts and feelings that are assessed by this measure may be relatively less responsive to the natural

healing effects of time. Interestingly, a descriptive plot of participants' scores on post-traumatic growth at Pre-, Post-, and Follow-up time points revealed that participants tended to improve in this domain from Pre- to Post- time points whilst they returned to the baseline level by the Follow-up. This observation is preliminary, yet perhaps invites an interesting research question in regards to whether expressively writing about a past upsetting event may influence different domains of emotional functioning in different ways.

**Participants Change the Types of Emotions about Which They Write from Visit 1 to Visit 3**

Participants wrote about different sets of emotions on the first and the third sessions. Briefly, (a) more participants wrote emotionally on Visit 3 compared to Visit 1, (b) the largest proportion of participants belonged to the "distressed group" on Visit 1 whilst the largest proportion belonged to the "distressed and meaning-making group" on Visit 3, and (c) of those who changed their emotional processing profiles between the two visits, the largest proportion consisted of those who were in the "distressed group" on Visit 1 and belonged to the "distressed and meaning-making group" on Visit 3, as shown in the Results section. The hypothesis that participants change their emotional processing profiles across Visit 1 and Visit 3 was supported.

Relevantly, the relative importance of the emotional states for clustering participants was also observed to differ between Harrington's cluster analysis of Visit 3 narratives (2012) and the current cluster analysis of Visit 1 narratives. On the one hand, self-compassion, global distress, fear/shame, rejecting anger, assertive anger, and hurt/grief served as the most to the least important emotional states for clustering in

Harrington's (2012). On the other hand, global distress, hurt/grief, fear/shame, self-compassion, rejecting anger, assertive anger, and resolution, served as the most to the least important emotional states for clustering in the current study. One additional emotional state, resolution, was included in the current study; however, this likely would not have significantly affected clustering given that resolution was the least important clustering variable. Although some design variances (e.g., sample size) may have contributed to the observed discrepancies between the two studies, these findings may also implicate differences in emotional processing between the two visits.

These findings from the exploratory analysis lay the foundation for further inquiry into some important research questions. For instance, the different ways by which participants changed their emotional processing profiles between the two writing sessions may be further explored to shed light into participants' progression in emotional processing across the two sessions. In that the largest proportion of those who changed their emotional processing profiles consisted of those who switched from belonging to the "distressed group" on Visit 1 to the "distressed and meaning-making group" on Visit 3, it could be speculated that participants in an expressive writing intervention may progress in a similarly sequential manner as described by Pascual-Leone and Greenberg (2007) in their study of clients in psychotherapy. This, combined with the finding that different emotional states contributed differently to clustering participants on the first and the third visit as previously described, may be revealing of some differences in the way participants processed their emotional experiences between the two visits.

Overall, the hypothesis testing highlighted differences in the kinds of emotions that some participants wrote (or did not write) on the first and the third visit, and provides

the groundwork upon which participants' psychological functioning and development through subsequent writing sessions may be further explored in the future.

**Limitations**

The current findings converge substantially with Harrington's study (2012) which was the first to apply the Classification of Affective-meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2005, Harrington, 2012) to study emotional processing in expressive writing. This said, given that the current study examined a sample from the same parental study by Pascual-Leone and colleagues (2011), it is crucial that findings be replicated in the future among independent samples.

Further, the psychological outcome measures used in the current study are those typically used to assess clinical symptoms of posttraumatic stress disorder, which may have posed a limitation on capturing the subclinical emotional experiences among the undergraduate students in the current sample. Relevantly, some measures have been devised in the context of expressive writing research to assess psychological functioning among subclinical samples. For instance, Pennebaker and colleagues (1990) in their program of research asked their sample of undergraduate students to identify the extent to which expressive writing was helpful and why. A similar measure on which participants rate the impact expressive writing has had on their psychological well-being may serve as a useful psychological outcome index. By broadening the focus beyond the distinct sets of clinically-relevant symptomatology, this type of measure may be used in future research to more flexibly capture the domains of psychological functioning and outcome that are relevant in a subclinical sample.

In a related vein, the use of the CAMS in the current study was restricted to the binary coding of the presence vs. absence of the key emotional states, which may have posed a limitation on evaluating the complex emotional experiences that are evidenced in participants' narratives. For instance, Pascual-Leone (2005) in his seminal cluster analysis identified therapy clients' emotional processing on the basis of the relative proportions of time clients spent expressing each of the CAMS emotional states. Similarly, in the current study, the *amount* of each key emotional state that participants express may have provided more information on their emotional processing profiles. There may be important differences, for instance, between participants who present primarily with early expressions of distress while expressing advanced meaning-making states minimally, and those who present with the opposite pattern. Coding from the CAMS in a binary manner and without gradients, simply cannot capture these differences. In future research, the use of the CAMS may be expanded to highlight these differences in order to explore the various ways in which the qualitatively different emotional states are expressed in personal narratives.

**Future directions**

It would be prudent in future research to assess the extent to which participants adhere to writing instructions. Insofar as different writing instructions are presumed to promote different styles of emotional processing, establishing ways to improve and assess adherence to these writing instructions will help elucidate the 'active components' of expressive writing – that is, the kinds of processes that facilitate outcome. Following specifically from the current study, such an attempt will establish a more systematic way

to address the link between writing about specific sets of qualitatively different emotions and emotional outcome in expressive writing.

The importance of this manipulation check was especially underscored in the finding from the current study that participants were able to be grouped on the basis of their emotional processing profiles as reflected in their personal narratives. Unfortunately, the downside of this post-hoc procedure is that the original random assignment of participants to the five writing conditions was lost. Participants in the post-hoc procedure were 'self-selected' into the three naturally-occurring clusters that differed in the overall levels of symptom distress in at least three areas: Post-traumatic growth, sense of resolution, and anxiety. These group differences among the three post-hoc clusters, including differences at the baseline, may have made it more difficult to detect any interactions between participants' emotional processing profiles and the passage of time in the current repeated-measures research design. In short, randomizing instructions to participants seems not to be enough. In order to better explore this puzzle, research will need to first consider ways to enhance adherence to writing instructions.

Another approach to further examine the link between writing about qualitatively different emotions and subsequent emotional change is to apply the Classification of Affective-Meaning States-modified (CAMS-M; Pascual-Leone & Greenberg, 2005; Harrington, 2012) to dissect the emotional content of the personal narratives in a different manner. Although no relationship was found between participants' emotional processing profiles and how participants benefited psychologically over time in the current study, participants did write about different emotions, which in turn were related to symptom distress. As discussed earlier, systematically identifying participants' emotional

processing profiles in a different manner, such as by coding with the CAMS-M the relative proportions of emotional states expressed in a given narrative, conceivably provides another and perhaps more sophisticated method to explore whether processing different kinds of emotions predicts emotional development.

**Implications**

Overall, it was demonstrated that the kinds of emotions that individuals express in their personal narrative are linked to the levels of emotional distress they are experiencing. This finding captures one essential principle described in Pascual-Leone and Greenberg's emotional processing model (2007) that qualitatively different emotions serve different functions upon a person's psychological well-being. In the current study, participants who evidenced only early expressions of distress were the most distressed while those who evidenced both early expressions of distress and advanced meaning-making states were the least distressed, assessed in terms of their posttraumatic growth, a sense of resolution, and anxiety. These findings are in line with past research that explored clients' emotional processing in psychotherapy from coding with the Classification of Affective-Meaning States-modified (Pascual-Leone & Greenberg, 2005; Harrington, 2012) and have important implications, both clinical and subclinical. For instance, altering writing instructions in a way that promotes the types of emotions that are associated with lower levels of distress, namely the advanced meaning-making states, may provide one viable way to optimize the psychological benefits of expressive writing. In a therapeutic context, these emotional states may serve as 'emotional markers' in a clinical assessment  to guide the therapist's decisions in relation to the kinds of emotions that should be promoted in the client (i.e., emotions that are linked to low emotional

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distress) and those that should be transformed into more advanced, 'helpful' states. Of course, the findings in this study were based on a subclinical sample of undergraduate students who wrote about their emotional experiences specifically in relation to a past upsetting event: These findings may not readily apply to other samples and populations. Further testing Pascual-Leone and Greenberg's model of emotional processing (2007) and exploring the boundaries that define its applicability remain to be an area of ongoing research quest.

As introduced at the beginning of the current study, expressive writing incurs various psychological benefits that bear promise, even in the face of the relatively small effect size. Expressive writing is brief, convenient, and cost-free. In light of these practical advantages, clarifying the ways in which expressive writing produces psychological benefits, and ways to maximize these benefits, warrants research attention. Although no relationship between participants' emotional processing and subsequent emotional development was found in the current study, the attempt at exploring participants' different emotional experiences during expressive writing yielded important, and some unexpected, findings. The notion that people who write happily are feeling happy is no longer an anecdote. By extending the efforts to systematically examine individuals' post-trauma emotional experiences that are qualitative and idiosyncratic in nature, future research in this area may contribute to the understanding of how expressive writing produces psychological benefits by: (a) Identifying the domains of psychological functioning that are related to the emotional experiences of a past upsetting event and that give rise to symptom distress, and (b) elucidating the types of emotional experiences that

serve to reduce symptom distress and/or promote emotional well-being during expressive writing.

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**Table 1**

*Five Original Writing Conditions and the CAMS Emotional States that the Instructions were*

*Modeled to Promote on the First Visit of the Expressive Writing Paradigm*

| Writing Condition | CAMS Emotional States Specified on Visit 1 |
| --- | --- |
| Task Control ($n = 49$) | N/A |
| Active Control ($n = 52$) | N/A |
| Venting ($n = 52$) | Early Expressions of Distress (i.e., Global Distress, Fear/Shame, Rejecting Anger) |
| Meaning-Making ($n = 51$) | Advanced Meaning Making States (i.e., Hurt/Grief, Self-compassion, Assertive Anger, Resolution) |
| Sequential Processing ($n = 51$) | Early Expressions of Distress |

*Note. N = 255.*

**Table 2**

*Summary of the Means and Standard Deviations of Scores among the Three Cluster*

*Groups by Time points (Pre-, Post-, and Follow-up) on the Seven Psychological Outcome*

*Variables*

| Time Points and Variable | Distressed and Meaning-Making Group ($n = 86$) | | Distressed Group ($n = 94$) | | Non-emotional Group ($n = 61$) | | Total ($N = 241$) | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Pre-[a]STAI | 46.47 | 9.64 | 49.92 | 11.38 | 48.25 | 12.58 | 48.25 | 11.18 |
| Post-[a]STAI | 44.85 | 10.27 | 47.88 | 10.77 | 46.49 | 12.80 | 46.45 | 11.18 |
| Follow-[a]STAI | 44.43 | 10.77 | 46.13 | 10.36 | 45.21 | 12.05 | 45.29 | 10.93 |
| Pre-[b]IESR | 32.79 | 16.04 | 33.52 | 16.77 | 30.16 | 18.86 | 32.41 | 17.05 |
| Post-[b]IESR | 24.57 | 16.45 | 28.45 | 17.97 | 24.64 | 18.79 | 26.10 | 17.68 |
| Follow-[b]IESR | 20.94 | 16.16 | 23.00 | 17.77 | 22.38 | 16.92 | 22.10 | 16.95 |
| Pre-[c]SWLS | 20.94 | 6.45 | 18.61 | 7.38 | 20.75 | 6.08 | 19.98 | 6.80 |
| Post-[c]SWLS | 22.59 | 6.78 | 20.27 | 7.07 | 22.57 | 6.09 | 21.68 | 6.80 |
| Follow- | 22.98 | 6.50 | 21.32 | 7.08 | 23.56 | 5.84 | 22.48 | 6.62 |

[c]SWLS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Pre-[d]PTGI | 30.44 | 9.59 | 24.60 | 10.76 | 27.21 | 10.21 | 27.34 | 10.49 |
| Post-[d]PTGI | 31.07 | 10.72 | 25.62 | 9.58 | 27.97 | 10.14 | 28.16 | 10.37 |
| Follow-[d]PTGI | 29.80 | 10.91 | 25.50 | 10.03 | 27.34 | 9.90 | 27.50 | 10.44 |
| Pre-[e]CESD | 11.55 | 6.10 | 12.25 | 6.88 | 10.77 | 6.22 | 11.63 | 6.45 |
| Post-[e]CESD | 10.29 | 6.03 | 11.26 | 6.52 | 10.23 | 6.92 | 10.65 | 6.45 |
| Follow-[e]CESD | 9.84 | 6.38 | 10.56 | 6.61 | 8.80 | 6.55 | 9.86 | 6.52 |
| Pre-[f]RS | 40.00 | 10.08 | 34.12 | 10.51 | 39.30 | 11.66 | 37.53 | 10.97 |
| Post-[f]RS | 43.78 | 10.80 | 40.04 | 9.83 | 43.08 | 10.30 | 42.15 | 10.40 |
| Follow-[f]RS | 45.27 | 10.01 | 42.61 | 10.13 | 44.30 | 9.65 | 43.99 | 10.00 |
| Pre-[g]ARS | 41.13 | 11.78 | 40.91 | 11.50 | 38.77 | 11.89 | 40.45 | 11.69 |
| Post-[g]ARS | 36.73 | 10.65 | 38.73 | 10.70 | 36.43 | 11.25 | 37.44 | 10.83 |
| Follow-[g]ARS | 34.27 | 10.00 | 36.29 | 10.78 | 35.62 | 11.87 | 35.40 | 10.79 |

*Note.* N = 241. *M* = mean. *SD* = Standard Deviation.

[a]STAI is the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983). [b]IES is the Impact of Event Scale-Revised (Weiss & Marmar, 1997).

[c]SWLS is the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).

[d]PTGI is the Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010). [e]CESD is the Center for Epidemiologic Studies

Depression Scale (Radloff, 1977). [f]RS is the Resolution Scale-Modified (based on Singh, 1994). [g]ARS is the Anger Rumination Scale (Sukhodolsky, Golub & Cromwell, 2001).

**Table 3**

*Bivariate Correlations among the Seven Outcome Variables Pooled across the Pre-, Post-*

*, and Follow-up Time Points*

| Measures | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 [a]STAI | - | .565[**] | -.658[**] | -.357[**] | .839[**] | -.591[**] | .594[**] |
| 2 [b]ESR | | - | -.334[**] | -.069 | .636[**] | -.552[**] | .586[**] |
| 3 [c]SWLS | | | - | .397[**] | -.555[**] | .514[**] | -.377[**] |
| 4 [d]PTGI | | | | - | -.309[**] | .451[**] | -.119 |
| 5 [e]CESD | | | | | - | -.459[**] | .561[**] |
| 6 [e]RS | | | | | | - | -.510[**] |
| 7 [g]ARS | | | | | | | - |

*Note. N* = 241.

[a]STAI is the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983). [b]IES is the Impact of Event Scale-Revised (Weiss & Marmar, 1997). [c]SWLS is the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). [d]PTGI is the Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010). [e]CESD is the Center for Epidemiologic Studies Depression Scale (Radloff, 1977). [f]RS is the Resolution Scale-Modified (based on Singh, 1994). [g]ARS is the Anger Rumination Scale (Sukhodolsky, Golub & Cromwell, 2001). **$p < .001$.

**Table 4**

*Separate One-Way Analyses of Variance on the Seven Psychological Outcome Measures*

*by Time*

| Psychological Outcome Measure | *df* | *F* | Partial $\eta^2$ |
|:---:|:---:|:---:|:---:|
| [a]STAI | 1.872 | 18.891** | 0.074 |
| [b]IES | 1.894 | 60.617** | 0.203 |
| [c]SWLS | 1.954 | 42.557** | 0.152 |
| [d]PTGI | 1.794 | 1.588 | 0.007 |
| [e]CESD | 1.887 | 11.565** | 0.046 |
| [f]RS | 1.750 | 66.730** | 0.219 |
| [g]ARS | 1.902 | 49.406** | 0.172 |

*Note. N* = 241. *df* = degrees of freedom. *Partial η2* = partial eta squared.

[a]STAI is the State-Trait Anxiety Inventory (Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983). [b]IES is the Impact of Event Scale-Revised (Weiss & Marmar, 1997). [c]SWLS is the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). [d]PTGI is the Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010). [e]CESD is the Center for Epidemiologic Studies Depression Scale (Radloff, 1977). [f]RS is the Resolution Scale-Modified (based on Singh, 1994). [g]ARS is the Anger Rumination Scale (Sukhodolsky, Golub & Cromwell, 2001). **$p < .001$.

**Table 5**

*Frequencies of Participants in the "Distressed," "Distressed and Meaning-making," and*

*"Non-emotional" Cluster Groups by Writing Sessions*

|  | Cluster Group | | |
| --- | --- | --- | --- |
|  | Distressed | Distressed & Meaning-making | Non-emotional |
| Session 1 | 46 | 39 | 25 |
| Session 3 | 43 | 51 | 16 |

*Note. N = 110.* $\chi^2$ = 8.095. degrees of freedom = 2. *Cohen's w* = 0.271. *p* = .017.

*Figure 1.* Participants in the "distressed meaning-making group" experienced higher levels of post-traumatic growth as opposed to those in the "distressed group," as measured by the Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun, 1996; Cann et al., 2010). Mean scores on the measure by the three cluster groups with error bars representing 95% confidence intervals are shown.

*Figure 2.* Participants in the "distressed meaning-making group" experienced higher

levels of personal sense of resolution as opposed to those in the "distressed group," as

measured by the Resolution Scale-Modified (RS-M; based on Singh, 1994). Mean scores

on the measure by the three cluster groups with error bars representing 95% confidence

intervals are shown.

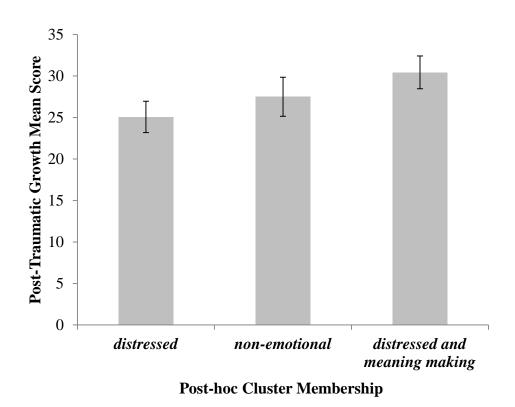*Figure 3.* Participants in the "distressed meaning-making group" experienced lower

levels of anxiety as opposed to those in the "distressed group," as measured by the State-

Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene,Vagg, & Jacobs, 1983).

Mean scores on the measure by the three cluster groups with error bars representing 95%

confidence intervals are shown.

# Appendix A

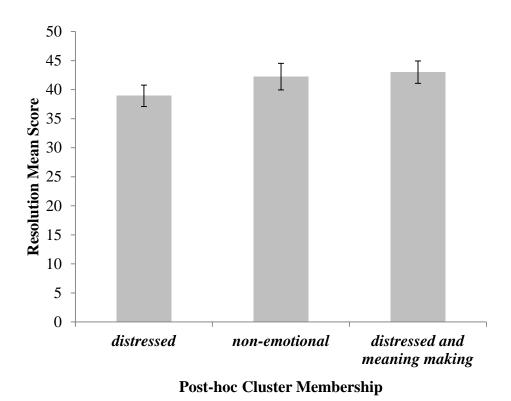The Resolution Scale-Modified (RS-M; based on Singh, 1994).

Instructions: The following questions ask you how you feel now in terms of your unfinished business with the issue you have identified. Please circle the number of the scale that best represents how you currently feel.

---

1. I feel troubled by my persisting unresolved feelings (such as anger, grief, sadness, hurt, resentment) regarding this issue.

   1          2          3          4          5          6

   Not at all                                              Very Much


2. I feel frustrated about not having my needs met regarding this issue.

   1          2          3          4          5          6

   Not at all                                              Very Much


3. I feel like a worthwhile person when it comes to this issue.

   1          2          3          4          5          6

   Not at all                                              Very Much


4. I see this issue negatively.

   1          2          3          4          5          6

   Not at all                                              Very Much


5. I feel comfortable about my feelings in relation to this issue.

   1          2          3          4          5          6

   Not at all                                              Very Much

6. This issue's negative impact on me has made me feel badly about myself.

| 1 | 2 | 3 | 4 | 5 | 6 |

Not at all                                                        Very Much


7. I feel okay about not having received what I needed regarding this issue.

1         2         3         4         5         6

Not at all                                                        Very Much


8. I feel unable to let go of my unresolved feeling regarding this issue.

1         2         3         4         5         6

Not at all                                                        Very Much


9. Apart from my own struggle, I have a real appreciation of the inherent difficulties in this issue (for example, the other person's own personal difficulties, or the unfortunately reality of the situation).

1         2         3         4         5         6

Not at all                                                        Very Much


10. I have come to terms with not getting what I want or need in the situation related to this issue.

1         2         3         4         5         6

Not at all                                                        Very Much


11. I view myself as being unable to stand up for myself when it comes to this issue.

1         2         3         4         5         6

Not at all                                                                                     Very Much


12. I feel accepting toward this issue.

1                2                3                4                5                6

Not at all                                                                                     Very Much

**Appendix B**

The Anger Rumination Scale (ARS; Sukhodolsky, Golub, & Cromwell, 2001)

Rate each item on a 4-point scale to describe your beliefs about yourself. Wherever possible, rate items particularly with respect to the personal issue you identified for this study.

*1 = "almost never", 2 = occasionally, 3 = frequently, 4 = "almost always"*

1.  I ruminate about my past anger experiences.

2.  I ponder about the injustices done to me.

3.  I keep thinking about events that angered me for a long time.

4.  I have long living fantasies about revenge after the conflict is over.

5.  I think about certain events from a long time ago and they still make me angry.

6.  I have difficulty forgiving people who have hurt me.

7.  After an argument is over, I keep fighting with this person in my imagination.

8.  Memories of being aggravated pop up into my mind before I fall asleep.

9.  Whenever I experience anger, I keep thinking about it for a while.

10. I have had times when I could not stop being preoccupied with a particular conflict.

11. I analyze events that make me angry.

12. I think about the reasons people treat me badly.

13. I have day dreams and fantasies of violent nature.

14. I feel angry about certain things in my life.

15.     When someone makes me angry I can't stop thinking about how to get back at this person.

16.     When someone provokes me, I keep wondering why this should have happened to me.

17.     Memories of even minor annoyances bother me for a while.

18.     When something makes me angry, I turn this matter over and over again in my mind.

19.     I re-enact the anger episode in my mind after it has happened.

The Impact of Event Scale-Revised (IES-R; Weiss & Marmar, 1997)

**INSTRUCTIONS:** Below is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you **DURING THE PAST SEVEN DAYS** with respect to _____, which occurred on _____. How much were you distressed or bothered by these difficulties?

Item Response Anchors are
0 = Not at all; 1 = A little bit; 2 = Moderately; 3 = Quite a bit; 4 = Extremely.

1. Any reminder brought back feelings about it.

2. I had trouble staying asleep.

3. Other things kept making me think about it.

4. I felt irritable and angry.

5. I avoided letting myself get upset when I thought about it or was reminded of it.

6. I thought about it when I didn't mean to.

7. I felt as if it hadn't happened or wasn't real.

8. I stayed away from reminders of it.

9. Pictures about it popped into my mind.

10. I was jumpy and easily startled.

11. I tried not to think about it.

12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.

13. My feelings about it were kind of numb.

14. I found myself acting or feeling like I was back at that time.

15. I had trouble falling asleep.

16. I had waves of strong feelings about it.

17. I tried to remove it from my memory.

18. I had trouble concentrating.

19. Reminders of it caused me to have physical reactions, such as sweating, trouble

breathing, nausea, or a pounding heart.

20. I had dreams about it.

21. I felt watchful and on-guard.

22. I tried not to talk about it.


Total IES-R score:_____

**Appendix D**

The State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, &

Jacobs, 1983).

DIRECTIONS: A number of statements which people have used to describe themselves are given below.  Read each statement and then **circle the number next to the answer that describes how you have been feeling in the past two weeks**. There are no right or wrong answers.  Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

|  | **Almost Never** | **Sometimes** | **Often** | **Almost Always** |
|---|---|---|---|---|
| 1.  I feel pleasant …………………………………………1 | | 2 | 3 | 4 |
| 2.  I feel nervous and restless ………………………… 1 | | 2 | 3 | 4 |
| 3.  I feel satisfied with myself …………………………1 | | 2 | 3 | 4 |
| 4.  I wish I could be as happy as others seem to be…… 1 | | 2 | 3 | 4 |
| 5.  I feel like a failure …………………………………. 1 | | 2 | 3 | 4 |
| 6.  I feel rested …………………………………………… 1 | | 2 | 3 | 4 |
| 7.  I am "calm, cool, and collected" ……………………1 | | 2 | 3 | 4 |

8. I feel that difficulties are piling up so that I cannot

   overcome them ………………………………… 1    2    3    4

9. I worry too much over something that really does

   not matter ……………………………………….. 1    2    3    4

10. I am happy ……………………………………………1    2    3    4

11. I have disturbing thoughts …………………………1    2    3    4

12. I lack self-confidence …………………………….1    2    3    4

13. I feel secure ………………………………………1    2    3    4

14. I make decisions easily ……………………………..1    2    3    4

15. I feel inadequate ………………………………… 1    2    3    4

16. I am content ………………………………………1    2    3    4

17. Some unimportant thought runs through my mind

   and bothers me ……………………………………1    2    3    4

18. I take disappointments so keenly that I can't

   put them out of my mind …………………………...1    2    3    4

19. I am a steady person ………………………………. 1        2        3        4

20. I get in a state of tension or turmoil as I think

over my recent concerns …………………………... 1        2        3        4

**Appendix E**

The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985)

DIRECTIONS: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Neither Agree or Disagree
5 = Slightly Agree
6 = Agree
7 = Strongly Agree

_____1. In most ways my life is close to my ideal.

_____2. The conditions of my life are excellent.

_____3. I am satisfied with life.

_____4. So far I have gotten the important things I want in life.

_____5. If I could live my life over, I would change almost nothing.

**Appendix F**

The Post-Traumatic Growth Inventory-Short Form (PTGI-SF; Tedeschi & Calhoun,

1996; Cann et al., 2010)


To what degree did you experience this change as a result of your crisis (or difficult

personal experience)?

0_not at all.
1_ very slightly
2_ slightly
3_moderately
4_greatly
5_ very greatly


1. I changed my priorities about what is important in life.

2. I have a greater appreciation for the value of my own life

3. I am able to do better things with my life.

4. I have a better understanding of spiritual matters.

5. I have a greater sense of closeness with others.

6. I established a new path for my life.

7. I know better that I can handle difficulties.

8. I have a stronger religious faith.

9. I discovered that I'm stronger than I thought I was.

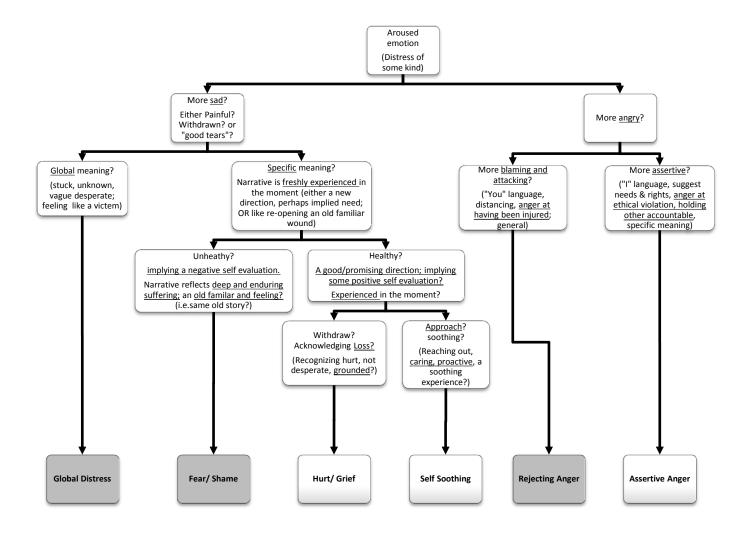10. I learned a great deal about how wonderful people are.

**Appendix G**

The Center for Epidemiologic Studies Short Depression Scale (CES-D; Radloff, 1977)

For each of the following statements, tell us how often you felt or behaved this way during the **past 2 weeks:**

| | **Rarely or none of the time** | **Some or a little of the time** | **Occasionally or a moderate amount of the time** | **Most of or all of the time** |
|---|---|---|---|---|
| 1. I was bothered by things that don't usually bother me. | | | | |
| 2. I did not feel like eating – my appetite was poor. | | | | |
| 3. I felt that I could not shake off the blues even with help from my family and friends. | | | | |
| 4. I had trouble keeping my mind on what I was doing. | | | | |
| 5. I felt depressed. | | | | |
| 6. I felt that everything I did was an effort. | | | | |
| 7. I had crying spells. | | | | |
| 8. I enjoyed life. | | | | |
| 9. I felt hopeful about the future | | | | |
| 10. I could not "get going." | | | | |

# Appendix H

## CAMS Coding Category Flowchart (Pascual-Leone, 2005)

**Aroused emotion**
(Distress of some kind)

**More sad?**
Either Painful? Withdrawn? or "good tears"?

**More angry?**

**Global meaning?**
(stuck, unknown, vague desperate; feeling like a victem)

**Specific meaning?**
Narrative is freshly experienced in the moment (either a new direction, perhaps implied need; OR like re-opening an old familiar wound)

**More blaming and attacking?**
("You" language, distancing, anger at having been injured; general)

**More assertive?**
("I" language, suggest needs & rights, anger at ethical violation, holding other accountable, specific meaning)

**Unheathy?**
implying a negative self evaluation.
Narrative reflects deep and enduring suffering; an old familar and feeling? (i.e.same old story?)

**Healthy?**
A good/promising direction; implying some positive self evaluation?
Experienced in the moment?

**Withdraw?**
Acknowledging Loss?
(Recognizing hurt, not desperate, grounded?)

**Approach?**
soothing?
(Reaching out, caring, proactive, a soothing experience?)

**Global Distress**

**Fear/ Shame**

**Hurt/ Grief**

**Self Soothing**

**Rejecting Anger**

**Assertive Anger**

## Appendix I

Fictional Narratives for the CAMS Emotion Codes

| Emotion Code | Narrative |
|---|---|
| Global Distress | I don't know why but I'm crying everyday. It's just too hard. |
| Fear/Shame | I'm afraid that no one will like me at the new school. |
| Rejecting Anger | I hate you for ruining my family! |
| Self-compassion | My wife loves me no matter what happens. |
| Assertive Anger | I have the right to feel safe. |
| Grief/Hurt | I realize now that I did not feel loved growing up and that is sad. |
| Resolution | I feel like I can finally let go and move forward from this. |

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