university of groningen / faculty of behavioural and social sciences / research master

Master's thesis

Framing Experience: The Relationship Between Metaphors, Expressive Writing, Insight, and Meaning

Name and initials: Marcel Näther

Student number: S3700593

E-mail address: m.nather@student.rug.nl

First assessor: Dr. Brian D. Ostafin

Second assessor: Dr. Elise C. Bennik

Programme: Research Master Behavioural and Social Sciences

Theme: Deficits, Distress and Disorders

ECs: 30

Date: 8-8-2023

Word count: 7777

Are there deviations of the Master's thesis from the proposed plan?
☐No
☒Yes, please explain below the deviations

Given that only a very low sample size was recruited, nonparametric analyses were run instead of those outlined in the master thesis plan. This also affected hypothesis testing, which was conducted on an exploratory basis rather than based on the planned hypothesis.

Abstract

This longitudinal online experiment investigated Expressive writing (EW) comparing control, standard EW, and metaphor EW conditions in an undergraduate student sample ($N = 9$). Using Wilcoxon and Kruskal-Wallis tests, we assessed how EW is linked to distress, meaning in life, insight, coherence, and trait avoidance. We found no significant effect on general distress and meaning, but a significant reduction of event-related distress at follow-up. While nonsignificant, the tendency of effects supported the potential of metaphors to enhance coherence, insight, and meaning, with the metaphor condition scoring higher on these constructs than the other two groups. Further, higher avoidance was linked to lower benefits from EW. Findings from this study highlight the importance of measuring distress at different levels and provide preliminary evidence for insight and coherence as mechanisms in EW. Moreover, this study extends the literature on metaphor and meaning to an EW context. Present research provides a valuable first look into novel EW-relevant constructs on which future studies can base mediation and moderation models in larger samples.

Framing Experience: The Relationship Between Metaphor, Expressive Writing, Insight, and Meaning

Engaging in ways that aid cognitive and emotional adaptation to negative and stressful experiences is important to maintaining mental health. Although individuals often process their experiences through talking, most deliberately so in psychotherapy, writing also presents itself as a means of processing difficult experiences. In fact, therapeutic practices themselves are frequently accompanied by some form of writing exercise. Diaries in Cognitive-Behavioral therapy (CBT), for instance, can make clients aware of dysfunctional patterns, whereas existential journal exercises in logotherapy help derive meaning from difficult experiences (Ruini & Mortara, 2021). Most substantially, however, researchers' recognition of the benefits of writing has been shaped by the body of literature surrounding the expressive writing (EW) paradigm. A great variety of investigations document EW as an effective and accessible intervention to reduce mental health problems (Frattarroli, 2006; Frisina et al., 2004; Travagin et al., 2015). Given that 11% of the general population experience subclinical symptoms of depression, anxiety, or stress (henceforth *distress*; OECD, 2018) while provision of mental health services often is scarce (Clark, 2018) writing interventions could constitute one way to expand low-intensity treatment accessibility (Bennett-Levy, 2010).

The present study aims to provide a comprehensive picture of different EW layers in which 1) outcomes of different valence, 2) writing variations, 3) underlying mechanisms, and 4) a moderating factor are accounted for assessed in a sample of university students.

Adverse Experiences and Psychopathology

The relationship between negative, stressful life events and experiencing symptoms of depression, anxiety, and PTSD is well-documented. For example, childhood adversities lead to higher levels of distress and problematic drinking behavior in adolescence (Dragan, 2018;

Low et al., 2012). Similarly, experiencing a greater number of stressful life events has been associated with higher levels of symptoms of depression (Jenness et al., 2019); a relationship that is strengthened in individuals reporting more of such events. Negative life events have also been linked to stronger distress as well as lower life satisfaction in young adults (Gungor et al., 2021).

This highlights the importance of dealing with adverse experiences to prevent the development or increase of psychiatric symptoms. While traumatic events are commonly treated with exposure therapy (McLean et al., 2022), and negative experiences more generally are treated with a variety of psychotherapeutic approaches, EW is a way to lower distress outside of therapy.

Expressive Writing

EW research was first driven by evidence that withholding negative experiences – *active inhibition* – is linked to worse health outcomes (Pennebaker, 1982). Inhibiting impactful negative experiences was assumed to constitute psychophysiological stress and weaken the immune system over time (Pennebaker, 1997). Hence, the seminal experiments testing EW as an intervention were based on the reasoning that expressing withheld negative experiences through writing (i.e., disinhibition) would be beneficial (Pennebaker & Beall, 1986); an idea that resembles catharsis in psychoanalytic thinking (Breuer & Freud, 1974).

While one branch of EW has been concerned with physical health and immune functioning (Gidron et al., 2002; Pennebaker, 1988; Robinson et al., 2022), most research has focused on psychological outcomes. In the original intervention, largely maintained in current research, subjects write about their deepest thoughts and feelings regarding a significant emotional issue for a specified period of time (e.g., 15 to 30 min.), usually repeated across multiple (e.g., three) occasions (Pennebaker, 1997). Generally, more sessions are more effective (Frattaroli, 2006). The instructions suggest writing about a central emotional issue

and relating it to relationships, past, present, and future. Also, it is left for the individual to decide whether to write about the same experience or alternate across sessions.

Psychological Distress

EW has been tested in diverse samples and in relation to a broad range of mental health constructs. Meta-analyses on mixed (Frattaroli, 2006), non-clinical (Travagin et al., 2015), and clinical (Frisina et al., 2004; Gerger et al., 2021; Pavlacic et al., 2019) populations revealed small to moderate improvements on psychological distress. Among the positively affected domains by EW are symptoms of anxiety (Alparone et al., 2015; Robertson et al., 2021), depression (Harvey et al., 2018), PTSD and posttraumatic growth (Gerger et al., 2021; Horsch et al., 2016; Zheng et a., 2019) as well as perceived stress (Sadovnik et al., 2011). This study will extend the literature on psychological distress in EW and focus on both general distress and distress associated with the negative event or experience (*event-related distress*). In light of the association between negative and stressful events and distress (e.g., Gungor et al., 2021), we are interested to see if lowering symptoms of event-related distress generalizes to symptoms of distress more broadly. Previous studies have primarily used measures of general distress (Frattaroli, 2006) or internalizing symptoms more broadly (e.g., Alparone et al., 2015; Harvey et al., 2018), which underlines a need for such differentiation.

Mechanisms

Constructs ranging from physiological to cognitive explanatory frameworks have proven useful in shedding light on the potential of EW. Yet, *how* EW reduces distress lacks consideration (Harrington et al., 2018). That being said, we will focus on two constructs – *insight* and *coherence* – that have been mentioned in discussions surrounding EW findings, which yet have not been tested explicitly. We believe these to pose fruitful mechanisms in future studies.

Insight

Considering the interest in EW has fundamentally been driven by its positive impact on mental health, processes pivotal to psychotherapy might be implicated in EW. This study suggests insight might be one such process.

Depending on the scientific context, one has to distinguish a more technical, problem-solving-centered form of insight that is centered around cognitive ability (DeYoung et al., 2008) from insight as alluded to in clinical environments. In the latter, insight can be thought of as "the coming upon of a new perspective on one's self or life" (Peill et al., 2022, p. 33). The self-understanding that insight is characterized by can enable awareness of what exactly constitutes the problem, imply solutions, and characteristically involves a quality of suddenness and ease (Topolinski & Reber, 2010). Across different schools of psychotherapy, insight has been found to moderately correlate with positive psychotherapeutic outcomes, emphasized as similarly influential as treatment factors like empathy, positive regard, and therapeutic alliance (Jennissen et al., 2018). Importantly, insight is not limited to a cognitive understanding but encompasses affective parts of the experience gained insight into. In other words, for insight to occur, comprehension across several layers of the experience is likely required (Lacewing, 2014). In EW, this is important in that an event is not only cognitively (i.e., by thinking and writing about it) but also affectively expressed as individuals sense feelings and emotions associated with what is disclosed.

So far, the case for a role of insight in EW can be made largely on the basis of its support in therapeutic settings. As individuals explore a topic when expressing it, we consider it likely that insight occurs as a consequence of writing, which in turn yields reductions in distress similar to improvements observed in therapy. We are interested in insight on two levels of analysis. First, in measuring insight on the level of self-report, and second, as indicated by causation (e.g., *because*, *effect*, *hence*) and insight (e.g., *think*, *know*, *consider*) word use. For this purpose, we will use the Linguistic Inquiry and Word Count (LIWC) program, which is a

well-established way to assess reflections of cognitive or emotional processes in EW texts (Tausczik & Pennebaker, 2010). This offers an implicit and explicit look at insight, which is crucial to distinguish insight as commonly assessed by the LIWC from subjective insight, the perception of having gained a better understanding of oneself.

Coherence

To assess more precisely how writing might yield benefits, we were also interested in *coherence* as a mechanism by which writing operates. Measures of coherence address the extent to which life makes sense, is understood as a whole, and to which extent its single parts are linked (Martela & Steger, 2022), which are themes that might well be influenced when writing about (i.e., trying to make sense of) distressing experiences. Interestingly, it appears that different sources of meaning need to form a coherent whole for such meaning to amount to a sense of purpose (Pöhlmann et al., 2006). Fundamentally, the very interpretation of experiences is predicated on a having coherent worldview (Koltko-Rivera, 2004), which is also true for distressing events. As argued by Park et al. (2010) distress disrupts an individual's meaning structure, eliciting a need to reestablish coherence across global and event-related aspects of meaning. Global meaning is composed of aspects such as goals, beliefs, and feelings and affects the perception of more specific, situational, meaning. From this perspective, the process of accommodating broader and narrower meaning domains is *meaning-making* (Park, 2013). When engaging in EW, individuals embark on such a process as they are challenged to articulate elements of both domains of meaning.

Metaphor

Another element common in psychotherapeutic dialogue, often mentioned in concert with insight, is figurative speech and metaphors especially (McCurry & Hayes, 1992). In metaphors, the qualities of something concrete (*source* domain) such as *journey*, are figuratively used to describe something more abstract (*target* domain) such as *life* (Casasanto,

2014). Thereby, they allow for cross-situational generalization and can facilitate understanding through the use of analogy (Goh et al., 2012). This renders them a powerful linguistic device for stimulating contemplation and restructuring of previous meanings. Early on, the value of gaining insight by making an implicit experience explicit through the use of figurative verbalization has been pointed out in the literature on psychotherapy (Barlow et al., 1977). This idea resembles the process of EW, where participants make their experience explicit through writing. Epstein (2013), for instance, discusses metaphors as a particular case of language use that portrays information more comprehensibly than does literal form, by evoking images, associations, and emotions. In CBT, metaphors are used to address unhelpful styles of thinking or maintaining behaviors by clarifying meaning, gaining a new view on the situation, or amplifying the impact of a message (Blenkiron, 2005). Experimentally, metaphorically rather than literally framed solutions to mental distress problems (e.g., '*I feel extremely frustrated because of beginning a major I don't like'* framed as '*Success in life is not about holding good cards, but playing bad cards well*') have been rated as more insightful and appropriate, which was linked to stronger activation of a neural network associated with insight (Yu et al., 2021). Relatedly, the efficacy of metaphors to conceptualize and promote understanding is evident in an RCT testing metaphor-based cognitive restructuring in addiction treatment, where metaphor-based sessions (involving assignments to internalize addiction-specific metaphors) successfully reduced several defense mechanisms (Komasi et al., 2016). Notwithstanding, the control group received no treatment, reducing the confidence with which this effect can be attributed to metaphors specifically. In another RCT, however, comparing a metaphor- and story-based with cognitive-behavioral education on pain, the metaphor condition demonstrated larger reductions in catastrophizing pain as well as higher increase in knowledge conveyed (Gallagher et al., 2013). These findings support the capacity

of metaphors as a tool to facilitate reconceptualization and treatment outcomes more generally.

As metaphors can capture life as a whole, shedding light on its continuity, purpose, or value (Landau, 2018), coherence might also be affected by the use of metaphors in EW. For instance, in participants who reported low levels of coherence, life metaphors significantly increased life meaning (Baldwin et al., 2018). More precisely, for participants who perceived different life aspects as lacking a coherent structure, metaphorically framing these different parts of life as a journey led to more meaning than in participants who reported more structure. This illustrates the potential of metaphors to provide structure to an experience where it was previously lacking, influencing the degree to which meaning is perceived. To test this notion of providing structure in particular, we will focus on coherence at the level of the event or experience participants write about.

Thus, evidence from different sources depicts metaphors as a useful tool to aid in grasping, conceptualizing, and understanding experience. In light of this, metaphors might pose a cognitive strategy for capturing the distressing experience one aims to write about more constructively. This study tries to address this potential by testing a variation of metaphor-based EW. Due to their link suggested the literature, we are specifically interested in the effect of metaphor use in EW on insight and coherence. Moreover, given that coherence can be assumed to constitute a precondition to meaning in life (Pöhlmann et al., 2006), we will look at meaning in life as an outcome variable as well. The relevance of assessing meaning can be further argued for in that a plethora of studies assess outcomes of negative valence (e.g., overall distress, depression, etc.; Frattarolli, 2006; Frisina et al., 2004; Reinhold et al., 2018), whereas positive outcomes are scarce.

Avoidance

As confronting distress is inherent to EW, we are also interested in the extent to which prior avoidance of this experience and its distress interact with participants' changes in symptoms. Avoidance is a transdiagnostic mechanism central to the maintenance of anxiety- and depression-related pathology (Forbes et al., 2020; Hofmann & Hay, 2018). A higher trait level of avoidance renders a person more likely to avoid unpleasant thoughts and experiences, which is directly related to the concept of emotional inhibition. Indeed, avoidance has been linked to inhibition of processing (Reynolds & Brewin, 1999). Specifically, with increasing avoidance of the distressing experience, more inhibition of negative cognitions and emotions can be expected. Relatively speaking, avoidant individuals conducting EW should thus have more negative cognitions and emotions to express (i.e., more potential to benefit) than those who have allowed the issue to pass their minds. This notion is supported by evidence that more avoidant participants with social anxiety disorder tend to benefit more from therapy that involves exposure to that which they avoided (Mesri et al., 2017). Yet, to our knowledge, no study has addressed the role of avoidance as a moderator of EW effects.

Given the prevalence of distress in university students (Granieri et al., 2021) and that expressive writing appears to be most effective in the range of mild to moderate symptoms (Frattarolli, 2006), we recruited students who have experienced a stressor causing distress in that range. We assessed the relationship among the aforementioned constructs in an exploratory fashion as the small sample size did not allow for complex analyses such as mediation and moderation. This led to the following exploratory questions:

1) Can we replicate a beneficial effect of EW on general and event-related distress and show that meaning in life is positively affected by EW?

2) Do EW conditions show higher levels of the potential mediators insight and coherence than controls and does the metaphor condition show higher levels than the standard EW condition?

3) Is trait avoidance implicated as a candidate moderator variable for future studies in that higher levels of avoidance are associated with larger reductions of event-related distress?

Method

Participants

Undergraduate psychology students at the University of Groningen ($N = 9$, $M_{age} = 22.33$, 66.67% male) were recruited through the online participation platform SONA and received credits upon participation. The sample consisted of 44.4% Dutch, 22.2% German, and 33.3% participants of other native backgrounds (i.e., Bulgarian, Singaporean, North American). Subjects were eligible if they experienced ongoing, chronic mild to moderate distress as a consequence of a stressor for two months or longer and were fluent in English. Exemplary mild to moderate stressors (see Appendix D) were listed on SONA. The study was approved by the Ethics Committee of Psychology (ECP) of the University of Groningen.

Measures

Distress was measured with the short-form Depression Anxiety Stress Scale (DASS-21; Henry & Crawford, 2005). It has three subscales *depression*, *anxiety*, and *stress*, each of which contains seven items and is assessed on a four-point Likert scale (0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *almost always*) and includes statements such as "I found it hard to wind down.". All subscales showed very good to excellent internal consistency ($\alpha = 0.82 – 0.93$). The DASS-21 demonstrated adequate convergent and discriminant validity in non-clinical populations (Crawford & Henry, 2003). In this sample, the internal consistency at T1 for *depression*, *anxiety*, and *stress* was poor to good with an α of 0.76, 0.57, and .85 respectively. For T2, internal consistency was acceptable to good with an α of 0.71, 0.72, and 0.80.

Event-related Distress was assessed by the short version of the Spiegelsberger State Anxiety Inventory (STAIS-5; Zsido et al., 2020). It consists of five statements such as "I feel

upset.", which are measured on a four-point Likert scale (1 = *not at all*, 2 = *somewhat*, 3 = *moderately so*, 4 = *very much so*). It demonstrated excellent internal consistency ($\alpha = 0.90$), good convergent validity, and excellent discriminant validity. The STAIS-5 in this sample showed an unacceptable α of 0.24 at T1 and an acceptable α of 0.727 at T2.

Avoidance was measured by the Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gámez et al., 2011). The MEAQ consists of 62 items measuring the six subscales *behavioral avoidance*, *distress aversion*, *procrastination*, *distraction & suppression*, *repression & denial*, and *distress endurance*. Respondents rate each item on a six-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*; e.g., "When something upsetting comes up, I try very hard to stop thinking about."). Only the subscales *distraction & suppression* and *repression & denial* were used in this study. The MEAQ has demonstrated good psychometric properties, displaying high internal consistency (α ranging from .73 to .88 across subscales), and has shown convergent and discriminant validity. The internal consistency in this sample was questionable for *distraction & suppression* ($\alpha = 0.68$) and poor for *repression & denial* ($\alpha = 0.49$).

Event-related Coherence was measured with items from the Multidimensional MIL Scale (MMIL; Costin & Vignoles, 2020) and the Three Dimensional Meaning in Life scale 3DM; Martela & Stega, 2022) that were adapted to the context of the study. The adapted *coherence* scale of the MIL includes statements like "I can make sense of the things that happen in this distressing part of my life." and was measured on a seven-point Likert scale (1 = *not at all true* to 7 = *very true*). *Coherence* on the 3DM was assessed on the same seven-point Likert scale and included statements like "Most things happening in this distressing part of my life do make sense to me.". The *coherence* subscale of the MMIL showed acceptable internal consistency ($\alpha = 0.77$) while that of the 3DM *coherence* was very good ($\alpha = 0.89$) in previous studies. Both showed very good convergent and good discriminant validity. In this

sample combining the two subscales, the internal consistency was unacceptable (α = 0.21) at T1 and acceptable at T2 (α =0.76).

Meaning was measured by the *meaningfulness* subscale Sources of Meaning and Meaning in Life Questionnaire (SoMe; Schnell, 2009). It measures statements like "I lead a fulfilled life." on a six-point Likert scale (0 = *strongly disagree* to 5 = *strongly agree*). It showed acceptable internal consistency (α = 0.71-0.78) in Norwegian and German samples, respectively, and demonstrated small to moderate correlations to convergent and discriminant measures, supporting its construct validity (Sørensen et al., 2019). The internal consistency at T1 in this sample was acceptable (α = 0.76) and poor at T2 (α = 0.49).

Insight was measured with the Psychological Insight Scale (PIS; Peill et al., 2022). The PIS consists of six items assessed on a five-point Likert scale (1 = *not at all*, 2 = *slightly*, 3 = *somewhat*, 3 = *very*, 4 = *somewhat*, 5 = *extremely*) such as "I have had important new insights about how past events have influenced my current mental health and behaviour.". It has demonstrated very good internal consistency (α = 0.94) and convergent validity. The PIS showed an excellent internal consistency of α = 0.92 in this sample.

Word Count was measured by the Linguistic Inquiry and Word Count (LIWC) program, a computerized way to quantify the use of various word groups in texts (Tausczik & Pennebaker, 2010). The reliability and validity (Pennebaker et al., 2015) of the LIWC have been supported by numerous studies demonstrating associations between word count and cognitive and behavioral outcomes (e.g., Robertson, 2021; Stockton et al., 2014; Zheng et al., 2019). In this study, causation (e.g., *because*, *effect*, *hence*) and insight (e.g., *think*, *know*, *consider*) word count was assessed.

A manipulation check was done through the Essay Evaluation Measure (Greenberg & Stone, 1992), which asks participants to which extent their writing was personal, emotional, and meaningful on a 6-point Likert scale, ranging from 0 = *not at all,* 1 = *only a little*, 2 = *to*

some extent, 3 = *rather much*, 4 = *very much*, 5 = *absolutely*). This served to assess whether participants followed their specific instructions.

Metaphors. Metaphoric statements concerned with distressing life experiences were drawn from the internet (BrainyQuote, 2023). To test which statements are best suited for the present experiment, a pilot study was run with the aim of sampling 15 statements. Recruitment was conducted via convenience sampling in one of the researchers' social networks. Participants ($N = 26$, $M_{age} = 25.31$, 73.07% female) rated thirty statements (n = 18-21 per statement) on the extent to which they found each statement *suitable* (i.e., the extent to which this statement captures a challenging experience, or elements thereof, well) and *insightful* (i.e., the extent to which this statement provides an insightful perspective on a challenging experience it relates to) on a five-point Likert scale (1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, 5 = *excellent*). Statements were ranked by descending mean values on each aspect and assessed in terms of which statements would occur in the highest-ranked 15 statements (see Appendix B). Thirteen of the top 15 statements were congruent across aspects. To reach the intended 15, two more statements were included. One occurred in the top 15 of *suitable* (i.e., ranked 10th) but not *insightful* (i.e., where it ranked 17th) and another occurred in the top 15 of *insightful* (i.e., ranked 8th) but not *suitable* (i.e., where it ranked 17th).

Instructions. Writing instructions for the control group were created for the purpose of this study. The rationale behind instructions for this group was to yield writing that was a neutral, descriptive, and objective as possible. To this end, we asked participants in the control group to describe specific elements of their daily life in as much detail as possible and without inclusion of personal information (see Appendix C for all instructions). Instructions for the standard expressive writing condition (EW) closely followed the original writing instructions (Pennebaker, 1997), excluding the phrase "You may write about the same general

issues or experiences on all days of writing or about different topics each day." (p. 162) to increase the likelihood that participants write particularly about the problem having in mind while having signed up for the study. For the expressive writing metaphor condition (EWM), instructions were similar to the EW instructions, with the addition of incorporating at least one of the metaphoric statements into writing.

Design

This two-factor (within-between) longitudinal online experiment consisted of four time points (T1-T4; see Appendix D for procedure timeline). T1 was followed by T2 48 hours later, which again was followed by T3 48 hours later. T4 followed seven days after T3. Participants conducted the study online via Qualtrics and were randomly allocated to one of three conditions: control, EW, or EWM.

Procedure

Participants received the link to T1 via SONA shortly (i.e., 5 min.) before the onset of their assigned slot. Participants followed the link to the Qualtrics environment. At T1, participants received information on the study and gave consent. They were instructed to conduct the study in silent, undisturbed surroundings, sitting at a desk using a laptop or desktop computer. Then, they filled in baseline questionnaire assessments of *Distress*, *Event-related Distress*, *Avoidance*, *Event-related Coherence*, and *Meaning*. Before the next part of the study, conditions EW and EWM were instructed that, if they would feel any distress as a consequence of the following writing exercise, they should contact the researcher via email or phone. Each experimental condition subsequently received instructions to conduct a writing exercise for eight minutes (see *Instructions* and Appendix C). Following writing, conditions EW and EWM were again instructed to contact the researcher in case of discomfort. After finishing the writing exercise, all conditions were asked to rate their writing on the *Essay Evaluation Measure* and were reminded to pay attention to their email inbox 48 hours later to

proceed with T2. After T1, participants in the EW and EWM conditions received information on how to cope with distress that might arise due to writing (see Appendix E). At T2, all conditions conducted the same writing exercise as at T1 and filled in the *Essay Evaluation Measure*, with conditions EW and EWM again being alerted to the possibility of contacting the researcher in case of distress prior to and after writing. At T3, all conditions filled in the measures *Meaning, Event-related Distress*, *General Distress* before conducting the writing exercise and, after, filled in *Essay Evaluation Measure*, *Insight*, *and Event-related Coherence* and a reminder to pay attention to the email for a link to T4 seven days. At T4, all participants filled in *Distress*, *Event-related Distress*, and *Meaning*. Upon participation in T4, all participants were debriefed about the background of the study.

Given that data collection started late into the academic year and sign-ups for the study were scarce, a shortened intervention was run to increase the possibility of continued recruitment. Participants who underwent a shortened version of the intervention conducted were assessed and engaged in EW twice, 24 hours apart. T1 consisted of the same measures as for the participants in the long intervention, while T2 consisted of measures employed for participants in the long intervention at T3.

Data Analyses

Statistical analyses were run with SPSS (Version 27.0). Given the small sample size, nonparametric analyses were run instead of parametric mediation and moderation analysis. First, data from the intervention including four assessment points and data from that including two assessment points were aggregated, constituting one sample composed of T1 and T2. A composite distress score was computed by averaging depression, anxiety, and stress subscores. Similarly, a composite avoidance score was computed by averaging across the two subscales (*distraction & suppression* and *repression & denial*) which was also done for the two coherence subscales. We investigated our exploratory aims through different

levels of nonparametric analyses. First, Spearman correlations were used to gain a first look if the associations between variables within T1 and T2. A Spearman correlation of avoidance and change scores of event-related distress was further computed to assess exploratory aim 3 that higher avoidance is linked to a larger reduction in event-related distress. Then, variables measured repeatedly (general and event-related distress, meaning, coherence, insight, causation words, insight words) were assessed on the extent to which they showed significant differences across T1 and T2 by bootstrapped (i.e., 10000 samples) Wilcoxon tests. Further, selectively those participants having conducted a seven-day follow-up measure were assessed on the difference between T1 and T4. After, Kruskal-Wallis tests were applied to test differences between groups on change scores of repeatedly measured variables. Both Wilcoxon and Kruskal-Wallis tests were used to assess if the findings support exploratory questions 1 and 2. To gain further insights into the levels of variables across groups, bar plots demonstrating the mean values of a given variable were used.

Results

The full sample ($N = 9$) was included in the analysis. There were no missing data. One univariate outlier appeared on avoidance and two univariate outliers occurred on follow-up event-related distress. All were kept in the sample as they presented scores in the expected range for this population. Visual inspection of QQ-plots (expected vs. normal values) as well as Shapiro-wilk tests indicated nonnormal distributions for T2 insight word count (i.e., bimodal). Descriptives can be found in Table 3 (see Appendix A).

Manipulation Checks

We evaluated the extent to which participants adhered to the writing instructions based on the essay evaluation measure. Groups were similar on the personal aspect, which was expected as the control group was instructed to write about things concerning their daily life (i.e., room, last meal, way to faculty). Demonstrating successful manipulation, the control

group scored distinctively lower on the aspects meaningful and emotional compared to EW and EWM (Table 1). Further, participants in the metaphor condition used at least one metaphor per writing session as instructed (Table 2).

Table 1

Essay Evaluation Measure at T1 and T2 by Group

Aspect	Control (n = 3)		EW (n = 3)		EWM (n = 3)	
	M (SD)		*M (SD)*		*M (SD)*	
	T1	T2	T1	T2	T1	T2
Personal	4.00 (1.73)	2.33 (1.53)	5.00 (1.00)	3.67 (2.31)	4.67 (1.15)	4.67 (1.15)
Meaningful	2.67 (1.53)	2.00 (1.00)	4.00 (1.00)	3.00 (1.73)	4.00 (1.73)	4.33 (1.53)
Emotional	2.67 (0.58)	1.00 (0.00)	4.67 (0.57)	2.67 (1.53)	3.33 (1.53)	4.00 (1.73)

Table 2

Metaphor Count

	Min.	Max.	*M*	*SD*
Metaphor Count T1	1	2	1.33	0.58
Metaphor Count T2	1	2	1.33	0.58

Preliminary Analysis

Spearman correlations were estimated to investigate overall associations between variables, at within T1 as well as across T2. Strong significant positive correlations arose between general distress at T1 and event-related distress at T2 (r = 0.794, p = 0.011), event-

related distress at T2 and general distress at T2 and causation words at T2 ($r = 0.669$, $p = 0.049$). These two correlations highlight the link between general and event-related distress. Avoidance was of interest in that individuals with higher levels might benefit more (i.e., show larger changes in event-related distress) from writing. While the moderate positive association between avoidance and the change score of event-related distress was nonsignificant ($r = 0.534$, $p = 0.139$), its direction is contrary to our expectations as higher levels of avoidance went along with less reductions in event-related distress.

Main Analysis

First, Wilcoxon tests were used to assess differences between time points on variables assessed twice or more. Then, group differences were assessed using Kruskal-Wallis tests to assess effects of EW on outcome variables and assumed potential mediator variables.

Distress and Meaning

The differences between T1 and T2 on general distress ($Z = -0.985$, $p = 0.191$, 95% CI [0.183; 0.198]), event-related distress ($Z = -1.28$, $p = 0.134$, 95% CI [0.128; 0.141]), and meaning ($Z = -0.69$, $p = 0.241$, 95% CI [0.232; 0.249]) were nonsignificant. However, an increase in meaning for the metaphor condition is noticed when assessed visually (Figure 1). When looking at participants who also conducted a follow-up assessment seven days after they completed their last writing exercise (Figure 2), however, a significant difference can be found between event-related distress at T1 and follow-up ($Z = -2.032$, $p = 0.03$, 95% CI [0.027; 0.033]). Groups EW and EWM showed a noticeable drop in event-related distress. Between groups, there was no significant difference in event-related distress ($H(2) = 2.00$, $p = 0.881$, 95% CI [0.793; 0.808]).

Change scores did not differ significantly across groups on general distress ($H(2) = 2.58$, $p = 0.359$, 95% CI [0.359; 0.377]), event-related distress ($H(2) = 0.84$, $p = 0.688$, 95% CI [0.679; 0.697]), or meaning ($H(2) = 1.80$, $p = 0.485$, 95% CI [0.475; 0.495]).

These findings do not confirm an effect on general distress or meaning as mentioned in exploratory question 1 but partly do support an effect of event-related distress and the tendency that EWM might benefit more from the intervention in terms of meaning.

Figure 1

Mean of Meaning in Life at T1 and T2 by Group

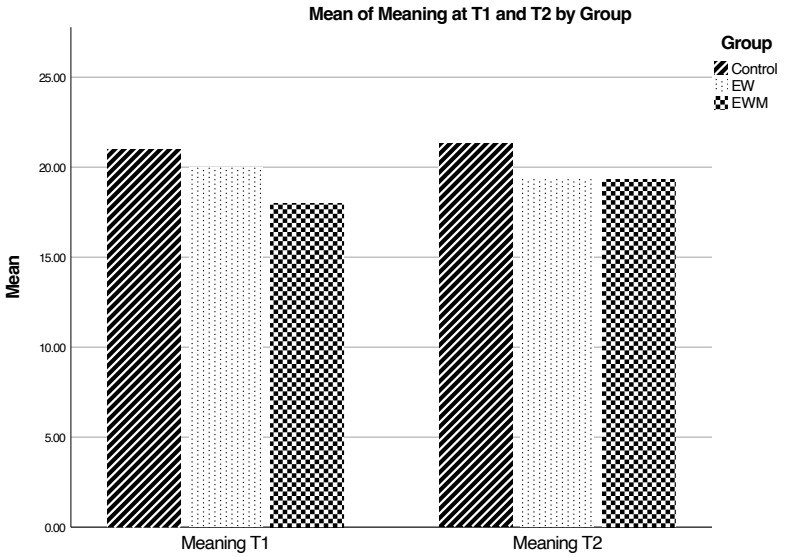
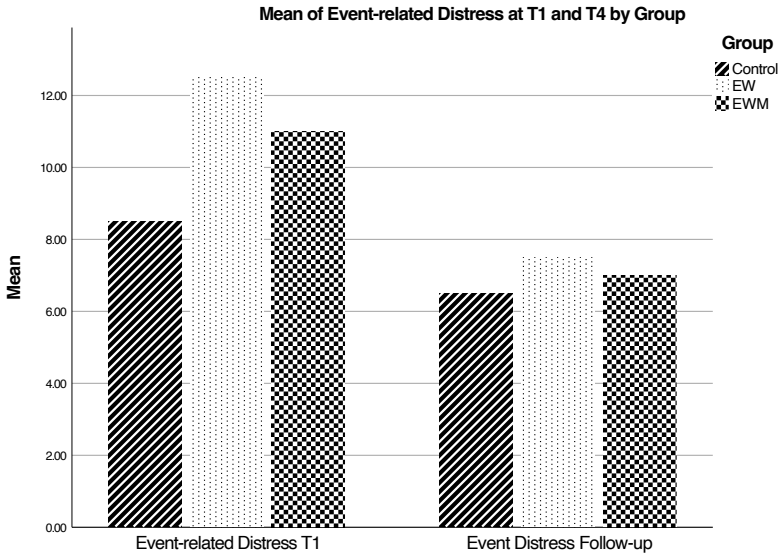


Figure 2

Mean of Event-related Distress at T1 and Follow-up by Group



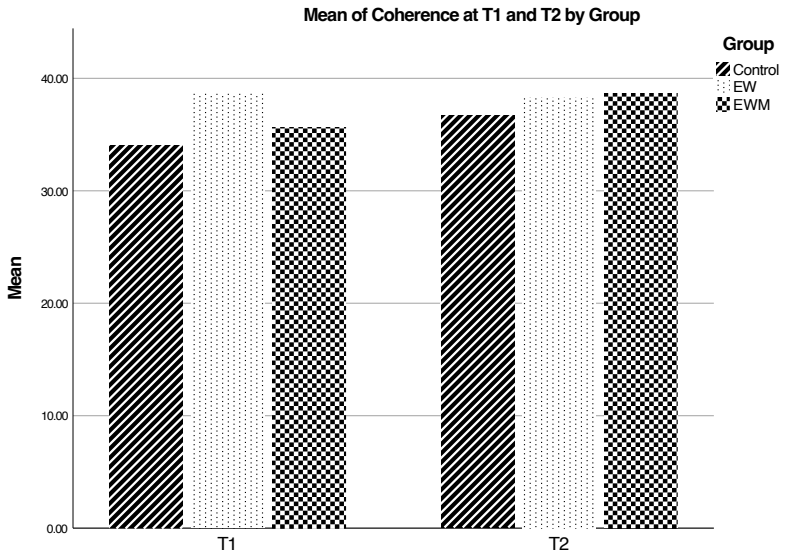
Note. Only data from participants having conducted seven-day follow-up is presented.

Coherence and Insight

While there was no significant difference on coherence across assessment points (Z = -0.77, p = 0.239, 95% CI [0.231; 0.247]) or between groups (H(2) = 0.36, p = 0.881, 95% CI [0.874; 0.887]) the tendency of effects between time points and differences between groups support an increase in coherence for the metaphor condition (see Figure 3).

Figure 3

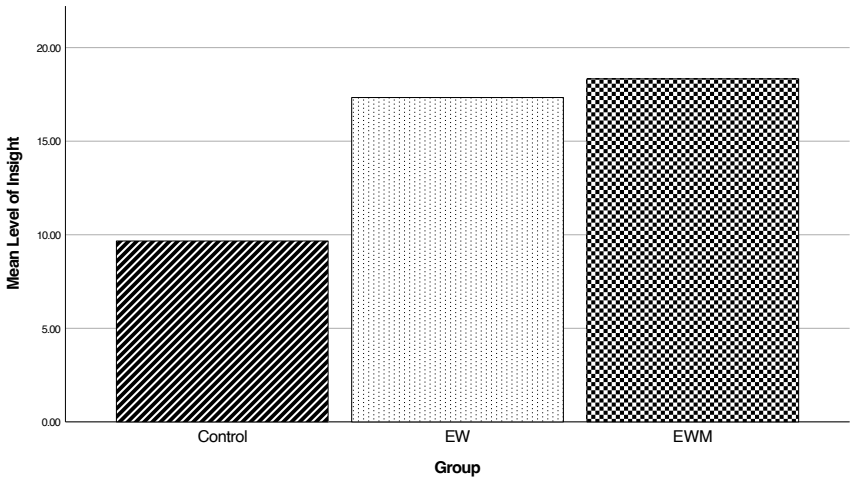
Mean of Coherence at T1 and T2 by Group



We also assessed group differences in insight (Figure 4) which was measured once only. The groups did not significantly differ on insight (H(2) = 4.86, p = 0.109, 95% CI [0.103; 0.115]). However, the writing groups reported noticeably more insight, with EWM (M = 18.33, SD = 3.48) demonstrating higher levels than EW (M = 17.33, SD = 2.40) which in turn were higher than controls (M = 9.67, SD =1.20).

Figure 4

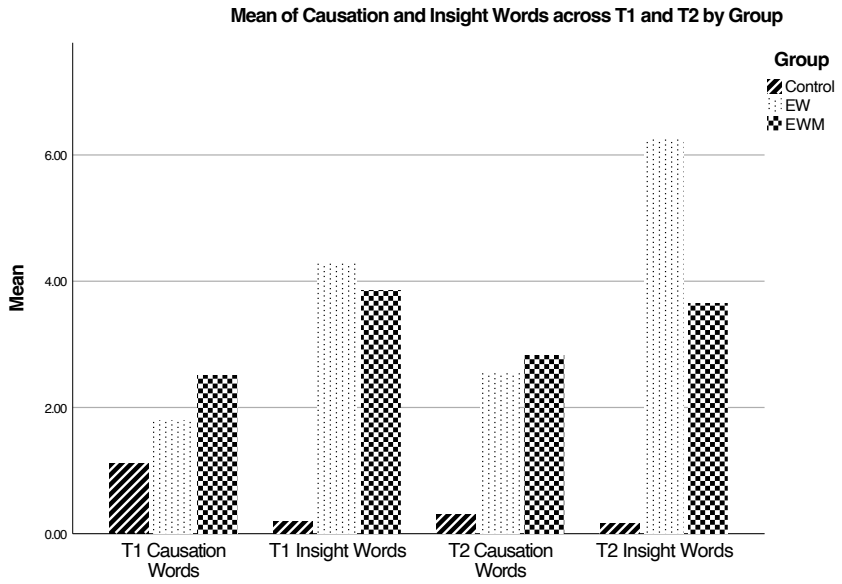
Mean Insight per Group



In terms of causation and insight word count compared between groups (Figure 5), a significant difference was found on insight words at T2 (H(2) = 5.65, p = 0.046, 95% CI [0.042; 0.05]) and a difference approaching significance on insight words at T1 (H(2) = 5.58, p = 0.057, 95% CI [0.053; 0.062]) as well as causation words at T1 (H(2) = 5.07, p = 0.084, 95% CI [0.079; 0.090]) and T2 (H(2) = 5.42, p = 0.072, 95% CI [0.066; 0.077]). EWM showed the highest overall use of causation words at T1 (M = 2.5, SD = 0.12) and T2 (M = 2.81, SD = 0.22) while EW demonstrated the highest overall insight at T1 (M = 4.28, SD = 1.3) and T2 (M = 6.24, SD = 0.53), which is contrary to our notion that EWM would increase insight over EW.

Figure 5

Mean Causation and Insight Word Use at T1 and T2 Across Groups



Note. Word count estimates presented in percentage of total written text.

Discussion

This study assessed a metaphor variation of EW and looked at its effect on outcome variables and those explored as mediators for future studies. Further, linguistic markers were investigated. No decline of general distress or increase of meaning outcome variable meaning was found. However, a significant decline in event-related distress emerged at follow-up. There were no significant changes in coherence and insight as a consequence of the intervention, yet the tendency of effects supported our notion that metaphor writing leads to more coherence, insight, and meaning than standard EW. Furthermore, conditions differed significantly on causation and insight word use, with EW yielding highest insight word use and EWM causation word use.

The finding that general distress was not affected is partly inconsistent with previous literature. In a meta-analysis looking at different outcomes of psychological health, overall distress has been found affected (Frattaroli, 2006). Similarly, EW has been reported to reduce levels subclinical levels of anxiety (Robertson et al., 2021) and depression (Harvey et al., 2018). It was only when assessing effects across several studies on symptoms of depression

that no significant benefits were found (Reinhold et al., 2018). However, the present finding might be explained by the observation that effects were larger when participants disclosed across three sessions or more (Frattaroli, 2006). Given that some participants in our sample only wrote twice in a relatively short period of time (i.e., within 24h), the intervention might not have been sufficiently impactful to reduce distress to an extent as general as captured by our measure. What is further relevant in contextualizing this finding is that the measure for general distress in this study is set at a one-week time scale. Except for participants that conducted the follow-up measure, therefore, specific changes in general distress might not have been captured. An absence of significant differences across conditions could be due to the fact that effects from T1 to T2 were not large to begin with, thereby rendering any difference that emerged unlikely to reach statistical significance.

Our finding that there was a significant reduction in event-related distress only when comparing T1 with follow-up assessment seven days after T2 indicates that time might be necessary for distress to be lowered. A similar finding that a stressful event was appraised less negatively as a consequence of EW has been reported (Park & Bloomberg, 2002). This highlights the importance of assessing distress at different levels, as perceptions concerning the event and general distress manifest different trajectories in this study. This is all the more noteworthy as previously mentioned studies with distress-related outcomes assessed general distress only. Moreover, the fact that there were no significant differences between conditions might point to an efficacy of EW in reducing event-related distress that is not necessarily facilitated by implementing metaphors. In other words, the benefit of EW in lowering distress specifically could primarily lie in the platform it provides for expressing thoughts and emotions surrounding the negative experience. This line of argumentation is underpinned by evidence on narrative-enhanced EW. That is, writing intentionally in narrative form did not lead to incremental gains compared to standard EW (Danoff-Burg et al., 2010) and even

aggravated distress in the narrative condition when baseline rumination levels were high (Sbarra et al., 2013). Although not exactly the case in the present study, top-down attempts to *structure* writing could hinder the *expressive* aspect of writing or at least not foster incremental gains over the standard paradigm. Approaches that facilitate expression through instructions on cognitive or emotional aspects, instead, have been found effective (e.g., Baum & Rude, 2013).

When it comes to meaning in life, we likewise found no significant effect. Upon visual inspection, however, a slight increase is noticeable for the metaphor condition. We were interested in meaning in life given that it has been linked to metaphors (Baldwin et al., 2018) and that coherence is necessary for a sense of purpose to emerge (Pöhlmann et al., 2006). Congruent with the reasoning that meaning is contingent on coherence, the absent effect of EW on meaning would follow the lack of effect of EW on coherence in this study. It is interesting nonetheless that, as is the case for meaning, the EWM condition demonstrated a slight increase in coherence; which is not evident for the EW condition. There has been only one previous study assessing the effect of EW on meaning in life, which found meaning to be positively affected by EW compared to controls (Zheng et al., 2019). This might be due to the larger sample size in Zheng et al. (2019) or the fact that they let participants write for 20 min. per session, potentially allowing for more writing from which a sense of meaning emerges. Additionally, Baldwin et al. (2018) found specifically those participants that were asked to frame several areas of life (e.g., decisions, difficulties, relationships, etc.) as a metaphor in writing ("*Life is a journey.*") to show an increase in meaning. Present findings support the notion that metaphors have a similar effect when implemented in expressive writing. The tendency of participants in the metaphor condition to demonstrate an increase in coherence as well as meaning, compared to EW or controls, suggests metaphors add value to EW by affecting meaning at different levels. Importantly, we tailored the conventional measure of

coherence to an event-related form of coherence. The observed increase in coherence, therefore, reflects an increase in the extent to which the *event* (not life at large) makes sense, is perceived as a whole, or its elements are linked. More broadly, the pattern present in our study hence supports the theoretical notion that metaphors can facilitate life meaning (Landau, 2018). The effect of metaphors on coherence and meaning might therefore help individuals conceptualize their negative experiences and provide an overarching frame in which to perceive sources of their distress.

Next to coherence and meaning in life, self-report insight was a construct that has not been looked at in previous EW research. Although a number of studies have looked at linguistic markers of insight, none have assessed insight into the negative experience grappled with as subjectively rated by participants. While there was no significant difference between the level of reported insight across conditions, both writing conditions demonstrated distinctively higher levels of insight than controls. Moreover, the EWM showed slightly higher levels of insight than EW. Fundamentally, it is an important finding that individuals do perceive expressive writing of either sort as providing insight into their experience. Despite this being a seemingly plausible consequence of writing about one's distressing experience, providing clear evidence of it is a pivotal first step toward elucidating the role insight plays in psychological interventions such as EW. Having been supported as an important element of psychotherapy from different sources (Jennissen et al., 2018; Wampold et al., 2007), insight is also present in subjective forms of processing a negative experience such as EW. This is consistent with early qualitative reports of students having gone through an EW intervention, who referred to the long-term benefits as "realizing what their problem is" (Pennebaker et al., 1990, p. 534). That being said, insight might provide clarity that affects distress or behavior over time. By assessing insight on the level of self-report, one also gains knowledge of the extent to which participants deemed the writing exercise as useful or successful for

themselves and their lives. In a clinical context, such information is important to capture as it indicates progress or an individual's own perception of the process. Further, although substantially lower than the level demonstrated by the writing conditions, even the control condition reported low-level insight. This interesting observation might reflect maturation over time or could be explained by the fact that participants were asked to only participate if they are dealing with a distressing issue, thereby naturally facing this issue somewhat over the course of the study.

Our findings concerning linguistic patterns of cognitive processing and insight, however, shed a different light on insight across conditions. On this implicit level of analysis, the EW condition demonstrated higher insight as evidenced by more frequent use of insight word count. By contrast, the EWM condition showed higher levels of cognitive processing more generally indicated by causation word use. How might this be interpreted? Previous studies have found both causation and insight word use in EW conditions. However, in some of these investigations (e.g., Boals, 2012; Ullrich & Lutgendorf, 2002) both cognitive and insight words were subsumed under the same category (i.e., cognitive words) while others (e.g., Klein & Boals, 2001; Stockton et al., 2014; Zheng et a., 2019) distinguished insight words from other forms (e.g., causation words) of cognitive words as we did. One could conceive of causation words as reflecting the individual still being in the midst of sense-making, whereas with insight words may display that a certain degree of understanding has been reached. What might relativize the discrepancy between the two measurements is that insight on the level of language and on self-report are not the same construct. While we expected them to be rather aligned, a person might gain insight as a sudden subjective experience that offers cognitive and emotional clarity not necessarily reflected in their language.

Finally, we assessed trait avoidance at baseline to get an idea of the extent to which a person's tendency to avoid distressing elements of their experience would relate to the benefit they gain from EW. On this construct, we expected no effect particular to a certain EW condition. Contrary to our expectations, the spearman correlation indicated the opposite. Namely, higher levels of trait avoidance went along with less change or even a slight increase of event-related distress. This pattern is inconsistent with studies associating avoidance to positively moderate treatment outcomes when exposed to the source of their anxiety (Mesri et al., 2017). However, it might reflect the finding that avoidance inhibits processing (Reynolds & Brewin, 1999) in the sense that trait avoidance could inhibit processing even when prompted to expose oneself to the stressful experience. We reasoned in the way that despite *generally* avoiding the experience, EW participants would *necessarily* process it. Nevertheless, it could be that participants high on avoidance did not fully disclose to an extent that would allow processing. In opposition to such an explanation, our manipulation checks would indicate that participants did confront emotions and meaningful themes. This finding further contradicts the idea of emotional inhibition since gains would be expected especially for individuals who withheld more negative experiences (Pennebaker, 1997).

Strengths and Limitations

This study comes with numerous strengths. We extended previous literature on EW by employing a metaphor variation and emphasizing the important question of mechanisms by which EW operates. Moreover, we aimed to provide a more comprehensive account of EW than is present in most studies, investigating different outcomes and explanatory constructs in concert. Nonetheless, this study comes with several limitations. First, the small sample size and concomitant nonparametric approach lower the statistical power of our analyses. This reduces the confidence with which inferences can be made from our findings. Relatedly, we were not able to account for the influence of other variables when assessing relationships

between any set of variables. Finally, the aggregation of data stemming from two interventions differing in the number of writing sessions might conceal effects specific to more frequent EW sessions.

Conclusion

This study provided tentative evidence on several theoretically implied constructs not previously tested in the EW literature. We focused on insight and metaphor as two well-established elements in psychotherapy and what role they might play in an EW context. Importantly, we showed how a metaphor-based EW might be differentially effective compared to the standard EW and tested the effect of writing on outcomes of different valence. Present research suggests both coherence and insight as variables that might become relevant as mechanisms by which EW operates; especially so when enhanced with distress-related metaphors. This contrasted a linguistic notion of insight with insight as perceived subjectively. Moreover, avoidance appears differently in EW than it would in exposure-based therapeutic settings. This research provides avenues for future studies with larger samples that can model present constructs in terms of mediation and moderation effects.

References

Alparone, F. R., Pagliaro. S., & Rizzo, I. (2015). The words to tell their own pain: linguistic markers of cognitive reappraisal in mediating benefits of expressive writing. *Journal of Social and Clinical Psychology*, *34*, 495–507. https://doi.org/10.1521/jscp.2015.34.6.495

BrainyQuote. (2023, January). *Popular Topics*. https://www.brainyquote.com

Baum, E. S., & Rude, S. S. (2013). Acceptance-enhanced expressive writing prevents symptoms in participants with low initial depression. *Cognitive Therapy and Research*, *37*(1), 35–42. https://doi.org/10.1007/s10608-012-9435-x

Baldwin, M., Landau, M. J., & Swanson, T. J. (2018). Metaphors can give life meaning. *Self and Identity*, *17*(2), 163–193. https://doi.org/10.1080/15298868.2017.1368696

Barlow, J. M., Pollio, H. R., & Fine, H. J. (1977). Insight and figurative language in psychotherapy. *Psychotherapy: Theory, Research & Practice*, *14*(3), 212–222. https://doi.org/10.1037/h0086530

Bennett-Levy, J., Richards, D. A., Farrand, P., Christensen, H., Griffiths, K. M., Kavanaugh, D. J., Klein, B., Lau, M. A., Proudfoot, J., Ritterband, L., White, J., & Williams, C. (Eds.). (2010). *Oxford Guide to Low Intensity CBT interventions.* Oxford University Press. https://doi.org/10.1093/med/9780199590117.001.0001

Blenkiron, P. (2005). Stories and analogies in cognitive behaviour therapy: a clinical review. *Behavioural and Cognitive Psychotherapy*, *33*(1), 45–59. https://doi.org/10.1017/S1352465804001766

Boals, A. (2012). The use of meaning making in expressive writing: When meaning is beneficial. *Journal of Social and Clinical Psychology, 31*(4), 393–409. https://doi.org/10.1521/jscp.2012.31.4.393

Breuer, J., & Freud, S. (1974). *Studies on Hysteria* (Ser. Pelican freud library, v. 3). Penguin Books.

Casasanto, D. (2014). Experiential origins of mental metaphors: Language, culture, and the body. In M. Landau, M. D. Robinson, & B. P. Meier (Eds.), *The Power of Metaphor: Examining its Influence on Social Life* (pp. 249–268). American Psychological Association. https://doi.org/10.1037/14278-011

Clark D. M. (2018). Realizing the Mass Public Benefit of Evidence-Based Psychological Therapies: The IAPT Program. *Annual Review of Clinical Psychology*, *14*, 159–183. https://doi.org/10.1146/annurev-clinpsy-050817-084833

Costin, V., & Vignoles, V. L. (2020). Meaning is about mattering: Evaluating coherence, purpose, and existential mattering as precursors of meaning in life judgments. *Journal of Personality and Social Psychology*, *118*(4), 864–884. https://doi.org/10.1037/pspp0000225

Crawford, J. R., & Henry, J. D. (2003). The depression anxiety stress scales (dass): normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology*, *42*(2), 111–131. https://doi.org/10.1348/014466503321903544

Danoff-Burg, S., Mosher, C. E., Seawell, A. H., & Agee, J. D. (2010). Does narrative writing instruction enhance the benefits of expressive writing?. *Anxiety, Stress, and Coping*, *23*(3), 341–352. https://doi.org/10.1080/10615800903191137

DeYoung, C. G., Flanders, J. L., & Peterson, J. B. (2008). Cognitive abilities involved in insight problem solving: an individual differences model. *Creativity Research Journal*, *20*(3), 278–290. https://doi.org/10.1080/10400410802278719

Dragan, M. (2020). Adverse experiences, emotional regulation difficulties and psychopathology in a sample of young women: model of associations and results of

cluster and discriminant function analysis. *European Journal of Trauma & Dissociation*, *4*(1). https://doi.org/10.1016/j.ejtd.2018.12.001

Epstein, S. (2014). *Cognitive-experiential Theory: An Integrative Theory of Personality*. Oxford University Press. Retrieved June 13, 2023, from https://rug.on.worldcat.org.

Forbes, C. N., Tull, M. T., Xie, H., Christ, N. M., Brickman, K., Mattin, M., & Wang, X. (2020). Emotional avoidance and social support interact to predict depression symptom severity one year after traumatic exposure. *Psychiatry Research*, *284*. https://doi.org/10.1016/j.psychres.2020.112746

Frattaroli J. (2006). Experimental disclosure and its moderators: a meta-analysis. *Psychological Bulletin*, *132*(6), 823–865. https://doi.org/10.1037/0033-2909.132.6.823

Frisina, P. G., Borod, J. C., & Lepore, S. J. (2004). A meta-analysis of the effects of written emotional disclosure on the health outcomes of clinical populations. *The Journal of Nervous and Mental Disease*, *192*(9), 629–634. https://doi.org/10.1097/01.nmd.0000138317.30764.63

Gallagher, L., McAuley, J., & Moseley, G. L. (2013). A randomized-controlled trial of using a book of metaphors to reconceptualize pain and decrease catastrophizing in people with chronic pain. *The Clinical Journal of Pain*, *29*(1), 20–25. https://doi.org/10.1097/AJP.0b013e3182465cf7

Gámez, W., Chmielewski, M., Kotov, R., Ruggero, C., & Watson, D. (2011). Development of a measure of experiential avoidance: the multidimensional experiential avoidance questionnaire. *Psychological Assessment*, *23*(3), 692–713. https://doi.org/10.1037/a0023242

Gerger, H., Werner, C. P., Gaab, J., & Cuijpers, P. (2021). Comparative efficacy and acceptability of expressive writing treatments compared with psychotherapy, other

writing treatments, and waiting list control for adult trauma survivors: a systematic review and network meta-analysis. *Psychological Medicine*, *1-13*, 1–13. https://doi.org/10.1017/S0033291721000143

Gidron, Y., Duncan, E., Lazar, A., Biderman, A., Tandeter, H., & Shvartzman, P. (2002). Effects of guided written disclosure of stressful experiences on clinic visits and symptoms in frequent clinic attenders. *Family Practice*, *19*(2), 161–166. https://doi.org/10.1093/fampra/19.2.161

Goh, M., Tan, A.-girl, & Choy, W. (2012). The influences of source representation of emotional expressions on analogical problem solving. *Procedia - Social and Behavioral Sciences*, *31*, 658–662. https://doi.org/10.1016/j.sbspro.2011.12.120

Granieri, A., Franzoi, I. G., & Chung, M. C. (2021). Editorial: psychological distress among university students. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.647940

Greenberg, M. A., & Stone, A. A. (1992). Writing about disclosed versus undisclosed traumas: Immediate and long-term effects on mood and health. *Journal of Personality and Social Psychology, 63,* 75–84.

Greenberg, M. A., Wortman, C. B., & Stone, A. A. (1996). Emotional expression and physical health: revising traumatic memories or fostering self-regulation?. *Journal of Personality and Social Psychology*, *71*(3), 588–602. https://doi.org/10.1037//0022-3514.71.3.588

Gungor, A., Young, M. E., & Sivo, S. A. (2021). Negative life events and psychological distress and life satisfaction in u.s. college students: the moderating effects of optimism, hope, and gratitude. *Journal of Pedagogical Research*, *5*(4), 62–75. https://doi.org/10.33902/JPR.2021472963

Harrington, S. J., Morrison, O. P., & Pascual-Leone, A. (2018). Emotional processing in an expressive writing task on trauma. *Complementary Therapies in Clinical Practice*, *32*, 116–122. https://doi.org/10.1016/j.ctcp.2018.06.001

Harvey, J., Sanders, E., Ko, L., Manusov, V., & Yi, J. (2018). The impact of written emotional disclosure on cancer caregivers' perceptions of burden, stress, and depression: a randomized controlled trial. *Health Communication*, *33*(7), 824–832. https://doi.org/10.1080/10410236.2017.1315677

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the depression anxiety stress scales (dass-21): construct validity and normative data in a large non-clinical sample. *The British Journal of Clinical Psychology*, *44*(2), 227–39.

Hofmann, S. G., & Hay, A. C. (2018). Rethinking avoidance: Toward a balanced approach to avoidance in treating anxiety disorders. *Journal of Anxiety Disorders*, *55*, 14–21. https://doi.org/10.1016/j.janxdis.2018.03.004

Horsch, A., Tolsa, J.-F., Gilbert, L., du Chêne, L. J., Müller-Nix, C., & Bickle Graz, M. (2016). Improving maternal mental health following preterm birth using an expressive writing intervention: a randomized controlled trial. *Child Psychiatry and Human Development*, *47*(5), 780–91. https://doi.org/10.1007/s10578-015-0611-6

Jennissen, S., Huber, J., Ehrenthal, J. C., Schauenburg, H., & Dinger, U. (2018). Association between insight and outcome of psychotherapy: systematic review and meta-analysis. *American Journal of Psychiatry*, *175*(10), 961–969. https://doi.org/10.1176/appi.ajp.2018.17080847

Klein, K., & Boals, A. (2001). Expressive writing can increase working memory capacity. *Journal of Experimental Psychology. General*, *130*(3), 520–533. https://doi.org/10.1037//0096-3445.130.3.520

Koltko-Rivera, M. E. (2004). The psychology of worldviews. *Review of General Psychology*, *8*(1), 3–58. https://doi.org/10.1037/1089-2680.8.1.3

Komasi, S., Saeidi, M., Zakiei, A., Amiri, M. M., & Soltani, B. (2016). Cognitive restructuring based on metaphor therapy to challenge the irrational beliefs of drug addicts undergoing buprenorphine treatment. *International Journal of High Risk Behaviors and Addiction*, *6*(1). https://doi.org/10.5812/ijhrba.31450

Koschwanez, H. E., Kerse, N., Darragh, M., Jarrett, P., Booth, R. J., & Broadbent, E. (2013). Expressive writing and wound healing in older adults: a randomized controlled trial. *Psychosomatic Medicine*, *75*(6), 581–590. https://doi.org/10.1097/PSY.0b013e31829b7b2e

Lacewing, M. (2014). Psychodynamic psychotherapy, insight, and therapeutic action. *Clinical Psychology: Science and Practice*, *21*(2), 154–171. https://doi.org/10.1111/cpsp.12065

Landau, M. J. (2018). Using metaphor to find meaning in life. *Review of General Psychology*, *22*(1), 62–72. https://doi-org.proxy-ub.rug.nl/10.1037/gpr0000105

Low, N. C., Dugas, E., O'Loughlin, E., Rodriguez, D., Contreras, G., Chaiton, M., & O'Loughlin, J. (2012). Common stressful life events and difficulties are associated with mental health symptoms and substance use in young adolescents. *BMC Psychiatry*, *12*, 116. https://doi.org/10.1186/1471-244X-12-116

Martela, F., & Steger, M. F. (2022). The role of significance relative to the other dimensions of meaning in life – an examination utilizing the three dimensional meaning in life scale (3dm). *The Journal of Positive Psychology*, *1-21*, 1–21. https://doi.org/10.1080/17439760.2022.2070528

McCurry, S. M., & Hayes, S. C. (1992). Clinical and experimental perspectives on metaphorical talk. *Clinical Psychology Review, 12*(7), 763–785. https://doi.org/10.1016/0272-7358(92)90023-2

McLean, C. P., Levy, H. C., Miller, M. L., & Tolin, D. F. (2022). Exposure therapy for PTSD: A meta-analysis. *Clinical Psychology Review*, *91*, 102115. https://doi.org/10.1016/j.cpr.2021.102115

Mesri, B., Niles, A. N., Pittig, A., LeBeau, R. T., Haik, E., & Craske, M. G. (2017). Public speaking avoidance as a treatment moderator for social anxiety disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, *55*, 66–72. https://doi.org/10.1016/j.jbtep.2016.11.010

OECD/EU (2018), *Health at a Glance: Europe 2018: State of Health in the EU Cycle*, OECD Publishing, Paris, https://doi.org/10.1787/health_glance_eur-2018-en

Park, C. L. (2013). Religion and meaning. In R. F. Paloutzian & C. L. Park (Eds.), *Handbook of the Psychology of Religion and Spirituality* (pp. 357–379). The Guilford Press.

Park, J., Ayduk, Ö., & Kross, E. (2016). Stepping back to move forward: Expressive writing promotes self-distancing. *Emotion, 16*(3), 349–364. https://doi.org/10.1037/emo0000121

Park, C. L., & Blumberg, C. J. (2002). Disclosing trauma through writing: testing the meaning-making hypothesis. *Cognitive Therapy and Research*, *26*(5), 597–616. https://doi.org/10.1023/A:1020353109229

Park, C. L., Edmondson, D., & Mills, M. A. (2010). Religious worldviews and stressful encounters: Reciprocal influence from a meaning-making perspective. In T. W. Miller (Ed.), *Handbook of Stressful Transitions Across the Lifespan* (pp. 485-501). New York: Springer.

Pavlacic, J. M., Schulenberg, S. E., Buchanan, E. M., Maxwell, N. P., & Hopke, T. G. (2019). A meta-analysis of expressive writing on posttraumatic stress, posttraumatic growth, and quality of life. *Review of General Psychology*, *23*(2), 230–250. https://doi.org/10.1177/1089268019831645

Peill, J. M., Trinci, K. E., Kettner, H., Mertens, L. J., Roseman, L., Timmermann, C., Rosas, F. E., Lyons, T., & Carhart-Harris, R. L. (2022). Validation of the Psychological Insight Scale: A new scale to assess psychological insight following a psychedelic experience. *Journal of Psychopharmacology (Oxford, England)*, *36*(1), 31–45. https://doi.org/10.1177/02698811211066709

Pennebaker, J. W. (1982). *The Psychology of Physical Symptoms.* Springer-Verlag Publishing. https://doi.org/10.1007/978-1-4613-8196-9

Pennebaker, J. W. (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science*, *8*(3), 162–166. https://doi.org/10.1111/j.1467-9280.1997.tb00403.x

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95*(3), 274–281. https://doi.org/10.1037/0021-843X.95.3.274

Pennebaker, J.W., Boyd, R.L., Jordan, K., & Blackburn, K. (2015). *The Development and Psychometric Properties of LIWC2015*.Austin, TX: University of Texas at Austin.

Pennebaker, J. W., Kiecolt-Glaser, J. K., & Glaser, R. (1988). Disclosure of traumas and immune function: Health implications for psychotherapy. *Journal of Consulting and Clinical Psychology, 56*(2), 239–245. https://doi.org/10.1037/0022-006X.56.2.239

Pöhlmann K., Gruss, B., & Joraschky, P. (2006). Structural properties of personal meaning systems: a new approach to measuring meaning of life. *The Journal of Positive Psychology*, *1*(3), 109–117. https://doi.org/10.1080/17439760600566008

Reinhold, M., Bürkner Paul-Christian, & Holling, H. (2018). Effects of expressive writing on depressive symptoms—a meta-analysis. *Clinical Psychology: Science and Practice*, *25*(1). https://doi.org/10.1111/cpsp.12224

Reynolds, M., & Brewin, C. R. (1999). Intrusive memories in depression and posttraumatic stress disorder. *Behaviour Research and Therapy*, *37*(3), 201–215. https://doi.org/10.1016/s0005-7967(98)00132-6

Robertson, S. M. C., Short, S. D., Sawyer, L., & Sweazy, S. (2021). Randomized controlled trial assessing the efficacy of expressive writing in reducing anxiety in first-year college students: the role of linguistic features. *Psychology & Health*, *36*(9), 1041–1065. https://doi.org/10.1080/08870446.2020.1827146

Robinson, H., Jarrett, P., Vedhara, K., Tarlton, J., Whiting, C., Law, M., & Broadbent, E. (2022). The effect of expressive writing on wound healing: Immunohistochemistry analysis of skin tissue two weeks after punch biopsy wounding. *Journal of Psychosomatic Research*, *161*, 110987. https://doi.org/10.1016/j.jpsychores.2022.110987

Rude, S. S., & Haner, M. L. (2018). Individual differences matter: commentary on "effects of expressive writing on depressive symptoms—a meta-analysis." *Clinical Psychology: Science and Practice*, *25*(1). https://doi.org/10.1111/cpsp.12230

Ruini, C., & Mortara, C. C. (2021). Writing technique across psychotherapies—from traditional expressive writing to new positive psychology interventions: a narrative review. *Journal of Contemporary Psychotherapy*, *1-12*, 1–12. https://doi.org/10.1007/s10879-021-09520-9

Sadovnik, A., Sumner, K., Bragger, J., & Pastor, S. C. (2011). Effects of expressive writing about workplace events on satisfaction, stress and well- being. *Journal of Academy of Business and Economics*, 11, 231–237.

Sbarra, D. A., Boals, A., Mason, A. E., Larson, G. M., & Mehl, M. R. (2013). Expressive writing can impede emotional recovery following marital separation. *Clinical Psychological Science*, *1*(2), 120–134. https://doi.org/10.1177/2167702612469801

Schnell, T. (2009). The sources of meaning and meaning in life questionnaire (SoMe): relations to demographics and well-being. *The Journal of Positive Psychology*, *4*(6), 483–499. https://doi.org/10.1080/17439760903271074

Sørensen, T., la Cour, P., Danbolt, L. J., Stifoss-Hanssen, H., Lien, L., DeMarinis, V., Pedersen, H. F., & Schnell, T. (2019). The sources of meaning and meaning in life questionnaire in the Norwegian context: Relations to mental health, quality of life, and self-efficacy. *International Journal for the Psychology of Religion*, *29*(1), 32–45. https://doi-org.proxy-ub.rug.nl/10.1080/10508619.2018.1547614

Stockton, H., Joseph, S., & Hunt, N. (2014). Expressive writing and posttraumatic growth: an internet-based study. *Traumatology*, *20*(2), 75–83. https://doi.org/10.1037/h0099377

Tausczik, Y., & Pennebaker, J. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*(1), 24–54. https://doi.org/10.1177/0261927X09351676

Topolinski, S., & Reber, R. (2010). Gaining insight into the "aha" experience. *Current Directions in Psychological Science, 19*(6), 402–405. https://doi.org/10.1177/0963721410388803

Travagin, G., Margola, D., & Revenson, T. A. (2015). How effective are expressive writing interventions for adolescents? A meta-analytic review. *Clinical Psychology Review*, *36*, 42–55. https://doi.org/10.1016/j.cpr.2015.01.003

Ullrich, P. M., & Lutgendorf, S. K. (2002). Journaling about stressful events: Effects of cognitive processing and emotional expression. *Annals of Behavioral Medicine, 24*(3), 244–250. https://doi.org/10.1207/S15324796ABM2403_10

Wampold, B. E., Imel, Z. E., Bhati, K. S., & Johnson-Jennings, M. D. (2007). Insight as a Common Factor. In *Insight in Psychotherapy.* (pp. 119–139). American Psychological Association. https://doi-org.proxy-ub.rug.nl/10.1037/11532-006

Yu, F., Zhang, J., Luo, J., & Zhang, W. (2021). Enhanced insightfulness and neural activation induced by metaphorical solutions to appropriate mental distress problems. *Psychophysiology*, *58*(10). https://doi.org/10.1111/psyp.13886

Zheng, L., Lu, Q., & Gan, Y. (2019). Effects of expressive writing and use of cognitive words on meaning making and post-traumatic growth. *Journal of Pacific Rim Psychology*, *13*. https://doi.org/10.1017/prp.2018.31

Zsido, A. N., Teleki, S. A., Csokasi, K., Rozsa, S., & Bandi, S. A. (2020). Development of the short version of the spielberger state-trait anxiety inventory. *Psychiatry Research*, *291*, 113223. https://doi.org/10.1016/j.psychres.2020.113223

Appendix A

Tables

Table 3

Descriptives at T1, T2, and Follow-up

Variable	Min.	Max.	*M*	*SD*
T1				
Avoidance	27.00	36.50	30.11	3.02
General Distress	14.00	26.67	22.22	4.32
Event-related Distress	8.00	14.00	11.44	1.94
Coherence	31.00	42.00	36.11	3.55
Meaning	15.00	24.00	19.67	3.54
Insight	8.00	24.00	15.11	5.60
Causation Words	0.30	2.68	1.81	0.79
Insight Words	0.00	6.25	2.78	2.43
T2				
General Distress	15.33	26.00	21.56	3.99
Event-related Distress	6.00	15.00	10.44	2.83
Coherence	28.00	47.00	37.89	6.23
Meaning	17.00	23.00	20.00	2.35
Causation Words	0.00	2.21	1.13	0.96
Insight Words	0.00	9.25	4.69	4.54
Follow-up (7 days)				
General Distress	15.33	22.67	18.27	2.89
Event-related Distress	6.00	8.00	7.00	.71

Table 3 (continued)

Meaning	13.00	25.00	19.20	4.49

Appendix B

Questionnaires

Distress

Depression Anxiety Stress Scales - Short Form (DASS-21)

I found it hard to wind down.

I was aware of dryness of my mouth.

I couldn't seem to experience any positive feeling at all.

I experienced breathing difficulty (e.g., excessively rapid breathing,

breathlessness in the absence of physical exertion).

I found it difficult to work up the initiative to do things.

I tended to over-react to situations.

I experienced trembling (eg, in the hands).

I felt that I was using a lot of nervous energy.

I was worried about situations in which I might panic and make a fool of myself.

I felt that I had nothing to look forward to.

I found myself getting agitated.

I found it difficult to relax.

I felt down-hearted and blue.

I was intolerant of anything that kept me from getting on with what I was doing.

I felt I was close to panic.

I was unable to become enthusiastic about anything.

I felt I wasn't worth much as a person.

I felt that I was rather touchy.

I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart

rate increase, heart missing a beat).

I felt scared without any good reason.

I felt that life was meaningless.

Event-related Distress

Spielberger State-Trait Anxiety Inventory (State)

I feel upset.

I feel frightened.

I feel nervous.

I am jittery.

I feel confused.

Avoidance

Multidimensional Experiential Avoidance Questionnaire

Distraction & Suppression

When something upsetting comes up, I try very hard to stop thinking about.

When negative thoughts come up, I try to fill my head with something else.

I usually try to distract myself when I feel something painful.

When upsetting memories come up, I try to focus on other things.

I work hard to keep out upsetting feelings.

When unpleasant memories come to me, I try to put them out of my mind.

When a negative thought comes up, I immediately try to think of something else.

Repression & Denial

I sometimes have difficulty identifying how I feel.

At times, people have told me I'm in denial.

I am able to "turn off" my emotions when I don't want to feel.

I don't realize I'm anxious until other people tell me.

I am in touch with my emotions.

People have said that I don't own up to my problems.

Others have told me that I suppress my feelings.

It's hard for me to know what I'm feeling.

I can numb my feelings when they are too intense.

Some people have told me that I hide my head in the sand.

It takes me awhile to realize when I'm feeling bad.

I feel disconnected from my emotions.

People have told me that I'm not aware of my problems.

Event-related Coherence

Three Dimensional Meaning in Life Scale (context-adapted)

Most things happening in this distressing part of my life do make sense to me.

By and large, I am able to understand the context of this distressing part of my life.

I can comprehend what this distressing part of my life is all about.

I can easily make sense of this distressing part of my life.

Multidimensional MIL Scale (context-adapted)

I can make sense of the things that happen in this distressing part of my life.

Looking at this distressing part of my life as a whole, things seem clear to me.

I can't make sense of some events in this distressing part of my life.

This distressing part of my life feels like a sequence of unconnected events.

Meaning

The Sources of Meaning and Meaning in Life Questionnaire

Meaningfulness

I lead a fulfilled life.

I think that there is meaning to what I do.

I have a goal in life.

I feel I belong to something bigger than myself.

I think my life has deeper meaning.

Insight

Psychological Insight Scale

I have had important new insights about how past events have influenced my current mental health and behaviour.

I have learned important new ways of thinking about my ‘self’ and my problems.

I have had important new insights about how I would like to change aspects of myself or my lifestyle.

I have become more conscious of aspects of my past that I used to ignore or not be fully aware of.

I have become more conscious of aspects of my ‘self’ that I used to ignore or not be fully aware of.

I have become more conscious of aspects of my lifestyle that I used to ignore or not be fully aware of.

Essay Evaluation

Essay Evaluation Measure

Please indicate the extent to which your writing was:

Your writing was personal.

Your writing was meaningful.

Your writing revealed your emotions

Appendix C

Metaphors for EWM Condition

"The walls we build around us to keep sadness out also keep out the joy."

"Anger is an acid that can do more harm to the vessel in which it is stored than to anything on which it is poured."

"A thought, even a possibility, can shatter and transform us."

"A good seed is nothing without healthy soil."

"Don't run from your weakness, you will only give it strength."

"The greatest glory in living lies not in never falling, but in rising every time we fall."

"One of the secrets of life is to make stepping stones out of stumbling blocks."

"He who would learn to fly one day must first learn to walk and run and climb and dance; one cannot fly into flying."

"The end of a melody is not its goal."

"No one can construct for you the bridge upon which precisely you must cross the stream of life, no one but you yourself alone."

"Mistakes are the portals of discovery."

"Every adversity, every failure, every heartache carries with it the seed of an equal or greater benefit."

"One cannot remake himself without suffering, for one is both the marble and the sculptor."

"First you take a drink, then the drink takes a drink, then the drink takes you."

"Humans only like to count their troubles; they don't calculate their happiness."

Appendix D

Writing Instructions and Procedure Timeline

Control Condition

T1

Please read the following instructions carefully.

During today's writing session, we would like you to describe in detail **the room in which you are currently living** for a duration of 8 minutes. It is important that you describe things exactly as they are. **Do not** mention any feelings or opinions you might have about the room. Your description should be **as objective as possible**, without any reflection or description of mental processes. As soon as 8 minutes have passed, a blue arrow will appear below the text box. **Please stop your writing when the arrow appears** and proceed to the next page of the study by clicking the arrow. If you find yourself having mentioned everything that comes to mind with regard to your room before the 8 minutes are over, please continue to describe another room that you are familiar with following the same instructions as stated above.

T2

Please read the following instructions carefully.

During today's writing session, we would like you to describe in detail **the procedure of the last warm meal you cooked** for a duration of 8 minutes. It is important that you describe things exactly as they are. **Do not** mention any feelings or opinions you might have about the room. Your description should be **as objective as possible**, without any reflection or description of mental processes. As soon as 8 minutes have passed, a blue arrow will appear below the text box. **Please stop your writing when the arrow appears** and proceed to the next page of the study by clicking the arrow. If you find yourself having mentioned everything that comes to mind with regard to the preparation of your last warm meal before the 8 minutes are over, please continue to describe another warm meal that you recently prepared, following the same instructions as stated above.

T3

Please read the following instructions carefully.

During today's writing session, we would like you to describe in detail **your way to the faculty building** for a duration of 8 minutes. It is important that you describe things exactly as they are. **Do not** mention any feelings or opinions you might have about the way. Your description should be **as objective as possible**, without any reflection or description of mental processes. As soon as 8 minutes have passed, a blue arrow will appear below the text box. **Please stop your writing when the arrow appears** and proceed to the next page of the study by clicking the arrow. If you find yourself having mentioned everything that comes to mind with regard to your way before the 8 minutes are over, please continue to describe another way that you are familiar with, following the same instructions as stated above.

Expressive Writing (EW) Condition

Please read the following instructions carefully.

For this writing session, we would like you to write about your very deepest thoughts and feelings about the distressing experience or event **that you had in mind when you signed up for this study**. In your writing, we would like you to really let go and explore your deepest emotions and thoughts. You might tie your topic to your relationships with others, including parents, lovers, friends or relatives; to your past, your present or your future; or to who you have been, who you would like to be or who you are now. All of your writing will be completely confidential. Don't worry about spelling, grammar or sentence structure. The only rule is that once you begin writing, **you continue for a period of 8 minutes**. **As soon as the time is up, a blue arrow will appear** below the text box. **Please stop your writing at this point** and proceed to the next page by clicking the arrow.

Expressive Writing Metaphor (EWM) Condition

Please read the following instructions carefully.

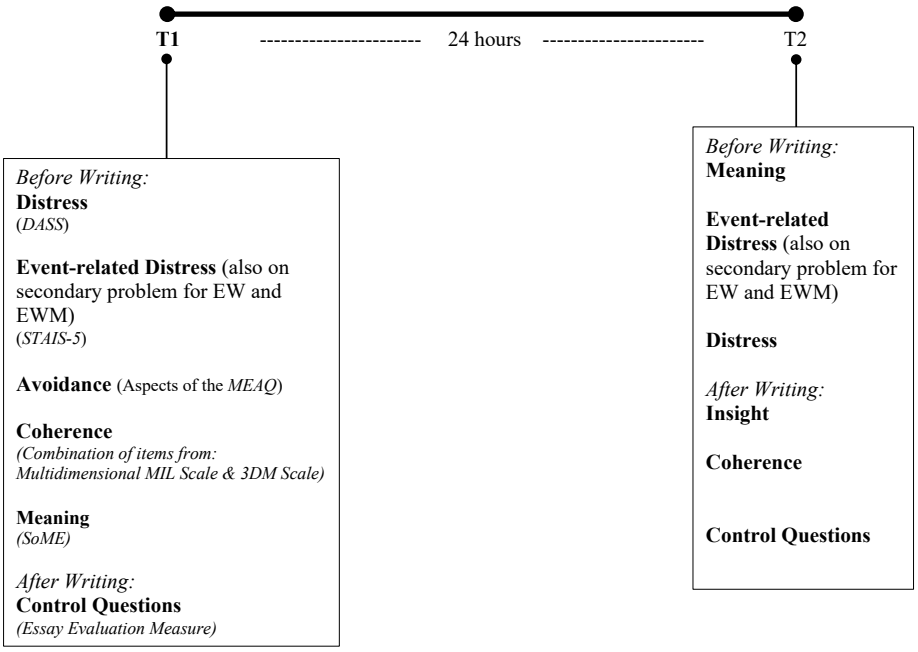
For this writing session, we would like you to write about your very deepest thoughts and feelings about the distressing experience or event **that you had in mind when you signed up for this study**. In your writing, we would like you to really let go and explore your deepest emotions and thoughts. You might tie your topic to your relationships with others, including parents, lovers, friends or relatives; to your past, your present or your future; or to who you have been, who you would like to be or who you are now. All of your writing will be completely confidential. Don't worry about spelling, grammar or sentence structure. The only rule is that once you begin writing, **you continue for a period of 8 minutes**.

Before you start writing, read through the metaphoric statements listed below. While reading through them, think about the distressing experience or event and pick one, or several, metaphors that you will implement in your writing. You may choose the statement(s) based on its (their) capturing how you felt at the time of your distressing experience, how your life or the world appeared to you in the context of it, or it (they) might provide an idea of how you overcome this experience and engage with it in a constructive way. You do not have to implement the exact same statement as it is written below. Rather, try to use the idea it (they) entail(s) for conceptualizing (parts of) the particular experience you write about.

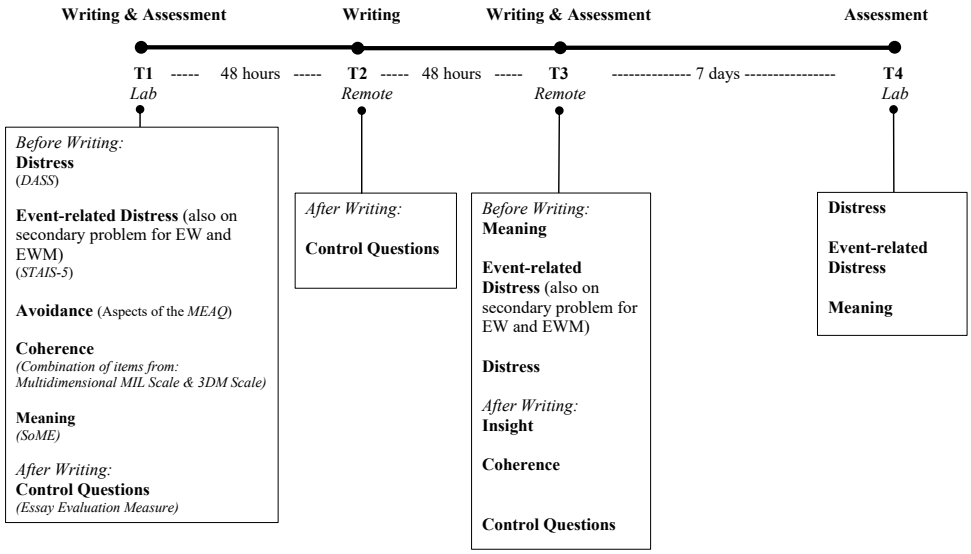
As soon as the time is up, **a blue arrow will appear** below the text box. **Please stop your writing at this point** and proceed to the next page by clicking the arrow.

Timelines

Procedure Timeline for Intervention Including Two Assessment Points



Procedure Timeline for Intervention Including Four Assessment Points



Appendix E

SONA

List of Mild to Moderate Stressor Examples on SONA

- Conflict in a relationship
- Not spending enough time with (important) people
- Homesickness
- Difficulty achieving a personal goal
- Perceived pressure to perform (e.g., at university, job, or other extracurriculars)
- Procrastination
- Dissatisfaction with a habit
- Confronting something unknown (e.g., settling into a new situation or environment)

Coping Suggestions

Confronting distressing experiences from the past can elicit negative feelings and memories. In case you are bothered by any symptoms after your writing, it can be helpful to engage in activities that you know are pleasant and help you to relax. What those might be of course differs per individual. You might consider activities such as playing sports, meditating, or engaging in hobbies. This can help get your mind off your present distress and generate pleasant sensations. Moreover, it can be helpful to share your feelings with close friends or family members. Please be aware that you decide for yourself if and when you want to talk about these feelings.

Moreover, you are always invited to contact the researcher of this study.