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Trauma Narratives: It's What You Say, Not How You Say It

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Abstract

Structural and content-related features of trauma narratives of traumatic events may help explain the development of PTSD. In a sample of 35 female assault survivors, we examined the association between the structure and content of trauma narratives and PTSD and other trauma-related reactions (i.e., depression, anxiety, anger, dissociation, and guilt). When controlling for recounting style and recounting distress, narrative structure was not strongly associated with PTSD or other trauma-related reactions. In contrast, the content of the trauma narratives (more positive and negative emotion words, higher cognitive process, and less self-focus being) was associated with lower symptomatology. Taken together, trauma narrative content rather than grammatical structure of the narrative may be more reflective of underlying emotional processing of the traumatic memory or lack thereof.

Keywords

posttraumatic stress disorder; trauma; narrative

Both structural and content-related aspects of trauma narratives recounted by trauma survivors may be associated with the development of posttraumatic stress disorder (PTSD) and other persistent trauma-related psychopathology. Structural features (e.g., disorganization and fragmentation) of the trauma narrative, that is, confusion regarding temporal order, difficulties accessing important details, and/or the presence of repetitions and speech fillers, may be indicative of some failure during encoding or elaboration of the actual trauma memories (e.g., Brewin et al., 1996; Ehlers & Clark, 2000; van der Kolk, 1987; van der Kolk & Fislser, 1995). Content feature of material in a traumatic narrative,

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particularly the appraisals about the event itself, the survivor his or herself, and others (e.g., Foa & Riggs, 1993; Jones et al., 2007; Kenardy et al., 2007, Klein & Janoff-Bulman, 1996; Negrao et al., 2005) may also differentiate who develops PTSD from those who do not. Thus, when recounting a traumatic event, individuals with PTSD may have traumatic narratives that have both different structure and content than individuals without PTSD.

The extant literature is mixed on the importance of the structure of trauma narratives, with some finding a strong relationship between fragmentation of trauma narratives and PTSD (Amir, Stafford, Freshman & Foa, 1998; Engelhard, van den Hout, Kindt, Arntz & Schouten, 2003; Halligan, Michael, Clark & Ehlers, 2003; Harvey & Bryant, 1999; Jones, Harvey & Brewin, 2007) and others unable to replicate these findings (Foa et al., 1995; Gray & Lombardo, 2001; Moulds & Bryant, 2005; Rubin, Feldman & Beckham, 2004; van Minnen et al., 2002; Zoellner, Alvarez-Conrad, & Foa, 2002). These mixed findings (see reviews by Brewin & Holmes, 2003; Zoellner & Bittinger, 2004) may be explained in part by variability in methods and lack of control for potentially confounding factors such as recounting style, recounting distress, and overall cognitive ability (Zoellner & Bittinger, 2004).

The examination of content of narratives has a much longer and richer history in social psychology (e.g., Campbell & Pennebaker, 2003; Groom & Pennebaker 2002, Pennebaker, Mehl, & Niderhoffer 2003) but is less well developed in terms of specifically examining trauma narratives. Specifically, the frequency of particular words occurring during narratives including emotion words (e.g., afraid), pronouns (e.g., I or we), and cognitive processing words (e.g., because), while an imperfect proxy for substance and meaning, is a reliable, if nonspecific, method of examining narrative content (Pennebaker et al., 2003). As might be expected, trauma narratives often contain more emotion words, with greater intensity, than non-trauma autobiographical narratives of individuals with PTSD (e.g., Byrne, Hyman & Scott, 2001; Porter & Birt, 2001; Tromp, Koss, Figueroa & Tharan, 1995); and individuals with PTSD often use more emotion words in trauma narratives than trauma-exposed individuals without PTSD (Berntsen et al., 2003; Hellowell & Brewin, 2004; Jones et al., 2007; Kenardy et al., 2007; Negrao et al., 2005). In addition, in trauma survivors, the presence of cognitive processing words is related to better PTSD post-treatment functioning (Alvarez-Conrad, Zoellner & Foa, 2001), and the presence of non-self-referential pronouns is related to poorer functioning (Klein & Janoff-Bulman, 1996).

Although much of the current research on the structure and content of trauma narratives focuses specifically on PTSD, other stress-related reactions such as depression, anxiety, dissociation, anger, and guilt commonly occur following trauma exposure (e.g., Andrews, Brewin, Rose, & Kirk, 2000; Ehlers, Mayou, & Bryant, 1998; Feeny, Zoellner, & Foa, 2000; Kubany, Abueg, Kilauano, Manke, & Kaplan, 1997; Tichenor, Marmar, Weiss, Metzler, & Ronfeldt, 1996). Yet, very little research has examined the relationship between the structure and content of trauma narratives and these other reactions (Alvarez-Conrad et al., 2001: anger, health; Eid et al., 2005: general distress; Moulds et al., 2005: depression; Zoellner et al., 2002: depression, anxiety). Further, only a few of the extant trauma narrative studies (Amir et al., 1998; Gray & Lombardo, 2001) control for important potential confounds such

as verbal or cognitive ability and anxiety or distress during recounting that could affect the structure and content of trauma narratives.

The goal of the present study was twofold. First, to examine the association between structure and content trauma narrative indices and PTSD severity, controlling for key confounding variables. Second, to examine how these factors related to accompanying reactions of depression, anxiety, dissociation, anger, and guilt. To address prior confounds, we controlled for recounting style, using a daily event narrative, and recounting anxiety, using subjective distress taken every minute during actual recounting. Both objective and in-depth subjective coding systems were employed across full narratives, as opposed to small narrative segments. We hypothesized that, after controlling for recounting style and recounting distress: 1) higher fragmentation and disorganization in the trauma narratives (i.e., structural components) would be associated with higher PTSD severity and other reactions (anger, guilt and dissociation); 2) the usage of more emotion words, lower cognitive processing, and less pronouns (i.e., content components) would predict higher PTSD severity and other reactions.

Method

Participants

Thirty-five female survivors of DSM-IV Criterion A assault (51.4% sexual assault, 25.7% childhood sexual abuse, 22.9% physical assault) participated in this study. Participants were recruited either through community advertisement or an introductory psychology course at a large urban university to participate in a study on memory and trauma. Inclusion criteria included being female, between the ages of 18–65 years old, fluent in English, and having experienced a DSM-IV Criterion A assault. For all potential participants, an initial phone screen described the study and assessed for probable Criterion A status related to the assault. In person, potential participants were assessed for Criterion A trauma exposure using the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997) and for the presence of psychiatric disorders using the Structured Clinical Interview for DSM-IV (SCID-IV; First, Spitzer, Gibbon & Williams, 1995). To better quantify the nature of the full sample, for those with probable PTSD based on the PDS (51.4%), a Ph.D.-level clinician confirmed the PTSD diagnosis utilizing the PTSD Symptom Scale (PSS-I; Foa, Riggs, Dancu & Rothbaum, 1993), with 34.3% meeting full PTSD diagnostic criteria. Participants were excluded from the study if they had a history of organic brain disorder, schizophrenia, or bipolar disorder.

Self-report and Interview Measures

The standardized psychopathology measures included the Posttraumatic Diagnostic Scale (PDS; Foa et al., 1997), the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970), the Trauma-Related Guilt Inventory (TRGI; Kubany et al, 1996), the State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988), and the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986). The PDS is a well-validated measure of trauma exposure and PTSD severity based on the seventeen DSM-IV PTSD symptoms,

with high internal consistency ($\alpha = .92$) and good test-retest reliability ($\kappa = .74$, Foa et al., 1997). The BDI is a 21-item measure that is used to assess severity of depression. The BDI demonstrates good reliability and validity (Beck, Steer, & Garbin, 1988). The 40-item STAI includes both a trait subscale which exhibits good test-retest reliability (.81) and a state subscale which shows lower test-retest reliability (.40), as would be expected for a state measure (Spielberger et al., 1970). TRGI is a 32-item measure that assesses trauma-related guilt, with global guilt subscale examined here. It has good test-retest reliability (.73 – .86) and convergent validity (Kubany et al., 1996). STAXI is a 44-item self-report measure that assesses anger across four scales, with anger trait and state examined here. This measure shows good internal consistency and convergent validity (Spielberger, 1988). Finally, the DES is a 28-item self-report inventory of trait dissociation or the general tendency to experience depersonalization, derealization, and altered perceptions during everyday. The DES has good test-retest reliability (ranges from .84 to .96; Carlson & Putnam, 1993).

Means, standard deviations, and ranges for self-report measures of psychopathology can be seen in Table 1.

Interview measures were the Structured Clinical Interview for DSM-IV (SCID-IV; First et al., 1995) and the PTSD Symptom Scale (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993). The SCID-IV is a semi-structured clinical interview used to assess current diagnostic status. The SCID-IV has acceptable inter-rater and test-retest reliability (DSM-III-R; Skre, Onstad, Torgersen, & Kringlen, 1991). The PSS-I is a 17-item clinical interview yielding both a total PTSD severity score and diagnostic status. Each DSM-IV symptom is rated on a 4-point scale from 0 (*not at all*) to 3 (*very much*) during the past two weeks. The PSS-I has good convergent validity, test-retest reliability, and inter-rater reliability (Foa & Tolin, 2000).

The Subjective Units of Discomfort Scale (SUDs; Wolpe, 1973) was used to assess state distress during narrative recounting. SUDs are self-ratings of anxiety ranging from 0 (*complete relaxation*) to 100 (*maximum distress*), with ratings corresponding well to physiological indices of fear activation (e.g., Griez et al., 1990).

Daily and Trauma Narrative Coding

Both objective and subjecting narrative coding of the daily and trauma narrative were conducted. As can be seen in Table 2, objective and subjecting coding were not strongly associated with one another.

Objective Narrative Coding—Linguistic Inquiry and Word Count, Version 1.80 (LIWC; Pennebaker, Francis, & Booth, 2001) provides the frequency of up to 85 language dimensions within written text (Francis & Pennebaker, 1992). For this study, we specified a priori the following language dimensions based on prior literature (e.g., Alvarez-Conrad et al., 2001; Bohanek et al., 2005): total word count, nonfluencies, speech fillers, positive emotion, negative emotion, pronoun use, and cognitive mechanisms. Total word count was included because previous studies have found differences in length between trauma narratives and other emotional narratives (Gray & Lombardo, 2001). In particular, both nonfluencies (e.g., hm, uh, um, er) and speech fillers (e.g., “You know”, “I mean”, “I don’t know”, “Like”) were conceptualized as structural measures of disorganization and

fragmentation. In terms of content measures, specifically, positive emotion words (e.g., happy, pretty, good), negative emotion words (e.g., hate, worthless, enemy), pronouns (e.g., I, our, they), and cognitive mechanism words suggestive of causal and insightful thinking (e.g., cause, know, ought) were examined. Death and dying words were not included due to their low frequency of usage in the trauma narratives ($n = 0$).

Subjective Rater-based Narrative Coding—Non-numerical Unstructured Data Indexing Searching and Theorizing System (NUD.IST N5: Qualitative Solutions and Research, 1994; Richards & Richards, 1994) is a qualitative text coding software program used to search the text of narratives word by word. Narratives were coded by research assistants blind to PTSD severity. Inter-rater reliability was assessed by cross-coding 20% of the narratives. A total percentage score for each category in each narrative was created using word units divided by the total word units used in the narrative. Two main categories were utilized: disorganization and fragmentation.

Disorganization: Disorganization was derived from Harvey and Bryant (1999) to include disjointedness, confusion, and repetition of an utterance. Examples of these include, for disjointedness: “he I was go brought with over;” for confusion: “I don’t know how I got up;” and for repetition: “I couldn’t get away... I couldn’t get away.” In the present study, inter-rater reliability was good for both disjointedness and confusion ($r = .82$, $r = .88$) but poor for repetition ($r = .28$). As a result, repetition was not included in the analyses.

Fragmentation: Fragmentation was derived from Foa, Molnar, and Cashman (1995) to include repetition of a word, unfinished thoughts, or speech fillers. Rather than coding for repetition of an utterance twice, we coded fragmentation repetitions as repetitions of words or incomplete thoughts rather than phrases. Examples of these include, for repetition: “my my my head my head was spinning;” for unfinished thoughts, “so then...;” and for speech fillers, “um.” Inter-rater reliability for the fragmentation subcategories was good, with repetition ($r = .98$) unfinished thoughts ($r = .83$), and speech fillers ($r = .97$) being high.

Procedure

As part of the informed consent process, including initial phone screen and in-person written informed consent, individuals were told that this was a study of memory and trauma exposure, helping to understand how trauma exposure and PTSD may influence memory functioning. Further, individuals were informed that they would be asked to recount both a neutral event and the traumatic event itself. After completing informed consent, for those with potential PTSD based on the PDS, the PSS-I and SCID-IV were administered by a Ph.D. level psychologist. For those who did not meet diagnostic criteria on the PDS, the SCID-IV was used to confirm lack of diagnostic status and was administered by a trained research assistant. Participants then completed self-report measures. Next, participants were asked to think about their weekly routine and to pick one daily task (e.g., mowing the lawn or driving to work) for their daily event. Participants were asked to describe first the daily event and then the trauma for 5 min each according to the following instructions by Foa, Molnar, and Cashman (1995, p. 679):

“I’m going to ask you to recall the memories of the [activity/assault] as vividly as possible. I don’t want you to tell a story about the [activity/assault] in the past tense. Rather, I would like you to describe the [activity/assault] in the present tense, as if it were happening now, right here. I’d like you to close your eyes and tell me what happened during the [activity/assault] in as much detail as you remember. This includes details about the surroundings, [your activities/your involvement], [the involvement of other people/the perpetrator’s activities], how you felt and what your thoughts were during the [activity/assault].”

For both events, participants were prompted every minute by the investigator to rate their SUDs, allowing for the completion of thoughts and sentences. The timing of SUDs prompts (e.g., 30s, 1 min, 2 min) was piloted to help balance capturing of acute distress versus disruption of the narrative, with 1 min providing the most optimal balance. When a participant finished the narrative in less than three minutes, the investigator asked the participant, “Are there any more details you can give me about ‘the surroundings, [your activities/your involvement], [the involvement of other people/the perpetrator’s activities], how you felt and what your thoughts were during the [activity/assault]?’ ”

Following completion of both narratives, participants were thoroughly debriefed and received compensation.

Results

Comparison Between Daily and Trauma Narratives

As discussed above, we identified a set of variables from LIWC and NUD.IST a priori based on the extant literature. As would be expected, trauma narratives differed from daily narratives, with more cognitive mechanism words ($M_{diff} = 2.63$, $SE = .52$, $t(34) = 5.01$, $p < .001$, $d = 1.40$), higher pronoun usage ($M_{diff} = 4.22$, $SE = .63$, $t(34) = 6.66$, $p < .001$, $d = 1.60$), more negative emotion words ($M_{diff} = .66$, $SE = .14$, $t(34) = 4.45$, $p < .001$, $d = .98$), greater disorganization ($M_{diff} = .01$, $SE = .03$, $t(34) = 3.32$, $p < .001$, $d = .75$), more fillers ($M_{diff} = .99$, $SE = .27$, $t(34) = 3.69$, $p < .01$, $d = .60$), and more words overall ($M_{diff} = 95.34$, $SE = 27.75$, $t(34) = 3.44$, $p < .01$, $d = .60$). They did not significantly differ from one another on positive emotions ($p = .46$), fragmentation ($p = .07$), or non-fluencies ($p = .23$).

Correlations Between Trauma Narratives and Psychopathology

As can be seen in Table 3, none of the structural fragmentation/disorganization measures (LIWC, NUD.IST) were strongly associated with PTSD symptoms. However, for content measures (LIWC), a different pattern emerged. Use of positive emotions was associated with lower overall PTSD severity and use of negative emotions, at a trend level, was associated with higher overall PTSD severity. Most interesting, the reexperiencing cluster of symptoms was most closely associated with narrative content variables, with higher use of cognitive mechanism words, pronouns, negative emotion words, and positive emotions all associated with lower reexperiencing.

Consistent with findings on PTSD severity, none of the structural fragmentation/disorganization measures (LIWC, NUD.IST) were strongly associated with depression,

anxiety, dissociation, guilt or anger. However, for content measures (LIWC), a different pattern emerged. In particular, in the trauma narrative, the use of cognitive mechanism words was associated with reduced dissociation, and the use of pronouns was associated with higher trauma-related guilt.

Prediction of PTSD, Reexperiencing, Dissociation, and Guilt

Based on the pattern of correlations discussed above, we focused prediction on overall PTSD severity, reexperiencing, dissociation, and guilt. Due to the weak associations between other structural components (i.e., fillers, non-fluencies, word count, fragmentation, disorganization) and these dependent variables, only content variables of cognitive mechanism, pronouns, negative emotions and positive emotions were included as independent variables. For all equations, as discussed above, daily narrative linguistic variables and average trauma recounting anxiety (SUDs) were entered in Step 1. In Step 2, trauma narrative linguistic variables were entered.

When predicting overall PTSD severity, Table 4 displays unstandardized regression coefficients (B), standard error, and standardized regression coefficients (β). Even after controlling for recounting style and anxiety, the use of positive emotion words (and negative emotion words, at a trend level) in the trauma narratives were associated with lower overall PTSD severity (overall $R^2 = .38$). This same pattern was more pronounced when examining the prediction of reexperiencing symptoms (overall $R^2 = .49$). After controlling for recounting style and anxiety, the use of positive emotion words and negative emotion words in the trauma narrative were associated with lower reexperiencing. Further, the use of pronouns and cognitive mechanism words in the trauma narrative were associated at a trend level with lower reexperiencing.

When predicting dissociation, Table 5 shows unstandardized regression coefficients (B), standard error, and standardized regression coefficients (β). Controlling for recounting style and anxiety, the use of cognitive mechanism words and negative emotion words in the trauma narratives were associated with lower dissociation (overall $R^2 = .31$). Further, in contrast to the prediction of PTSD, with dissociation, the use of pronouns in the trauma narrative was the strongest predictor of higher dissociation.

Finally, when predicting trauma-related guilt and consistent with the prediction of dissociation, use of pronouns during the traumatic narrative was associated with increased trauma-related guilt (overall $R^2 = .36$). Further the use of pronouns in the daily narrative continued to be associated with more trauma-related guilt See Table 5.

Discussion

After controlling for recounting style and subjective recounting distress, content and not structural components of trauma narratives predicted post-trauma psychological reactions. In particular, the use of positive and negative emotion words in trauma narrative was associated with lower PTSD reexperiencing symptoms. Further, the use of pronouns was associated with both higher dissociation and trauma-related guilt. However, there was no strong relationship between structural attributes of the trauma narratives and

psychopathology. Taken together, it may be that what individuals say during their trauma narratives (e.g., emotion words, pronouns) rather than the manner in which they say it (e.g., fragmentation, disorganization) plays a more central role in PTSD and other associated reactions. Though prospective studies are needed, these findings point to the potential relevance of cognitive or emotional processing theories that focus on the content of trauma narratives (e.g., Ehlers & Clark, 2000; Foa & Kozak, 1986) rather than theories that focus on the fragmented or disorganized structure of trauma narratives (e.g., van der Kolk, 1987; van der Kolk & Fisler, 1995).

Even after controlling for recounting style and distress, the higher use of negative and positive emotion words in the trauma narrative was associated with lower PTSD symptom severity. One interpretation may be that individuals who are able to actively express their experience of both negative and positive emotions in the trauma narrative have more successfully emotionally processed the trauma memory than those who are not able to do so (e.g., Foa & Kozak, 1986; Foa & Riggs, 1993; Rauch & Foa, 2006). In contrast, higher use of pronouns in the trauma narrative was associated with both higher trauma-related global guilt and higher trait dissociation, even after controlling for recounting style and distress. Accordingly, the higher usage of pronouns, potentially reflecting a focus on oneself (e.g., Campbell & Pennebaker, 2003; Pennebaker, Mehl & Neiderhoffer, 2003), may be indicative of self focus that may be intimately linked with persistent dissociation (e.g., Briere et al., 2005; Foa & Hearst-Ikeda, 1996; Panasetis & Bryant, 2003) and trauma-related guilt (e.g., Kubany & Watson, 2003). Indeed, negative views about oneself are associated with both dissociation and self-blame and with more event-related intrusions (e.g., Evans, Ehlers, Menzy, & Clark, 2007).

Structural narrative components, however, were not consistently associated with PTSD, depression, anxiety, dissociation, anger, or guilt. This is consistent with a growing body of literature (Bohanek et al., 2005; Byrne et al., 2001; Gray & Lombardo, 2001; Moulds & Bryant, 2005; Porter & Birt, 2001; Rubin et al., 2004; Zoellner et al., 2002). Although care needs to be taken when interpreting null findings, some of the observed relationships were nearly orthogonal and, when showing an association, were seen largely in the daily narrative, arguing for the importance of controlling for recounting style. Taken together, despite the strong focus on encoding and the structure of memories in numerous theories of PTSD (e.g., Brewin et al., 1996; Brewin, 2003; Clark & Ehlers, 2004; Ehlers & Clark, 2000), our findings suggest a limited role of structural aspects of the trauma narrative. That said, narratives, which may be an indirect indicator of the nature of a trauma memory, should not be assumed to directly reflect encoding or structure of this memory as other factors such as previous retrieval, verbal ability, and distress are assumed to also impact trauma narratives.

This study improves upon previous methods by including both objective and subjective narrative indices in the same study, both content and structural indices in the same study, systematic structured clinical assessment of trauma exposure and PTSD, a homogenous sample, and importantly controls for recounting style using the daily narrative and recounting distress taken throughout narrative production. Nevertheless, the present study is limited by its cross-sectional nature, merely showing associations and not causation. Clearly,

well-controlled prospective studies are needed in this area. Further, the coding programs utilized may still be inadequate for assessing present constructs of interest and thus our results need to be appropriately tempered. Yet, we used constructs and coding methods routinely used in this area. A next important step is to utilize more contextual-based objective coding methods to better understand the meaning and context of key narrative content. It also should be noted that the content of trauma narratives most likely reflects a variety of factors, including initial encoding, repeated retrieval (e.g., disclosure), and elaboration of the original event; and thus, our results should not be interpreted as solely reflecting the initial encoding of the traumatic event. Probing for SUDs ratings during both the daily and trauma narratives to capture acute distress may have altered the content of the narratives, specifically potentially increasing the fragmentation components of the narratives. Further, using the instruction set from Foa, Molnar, and Cashman (1995), though using a standardized method, may have altered the content and flow of the natural narratives. Finally, our sample size is small, raising issues of the stability of the regression findings in future samples. Accordingly, the findings need to be replicated in larger samples, examining subgroups such as comparing other forms of trauma exposure, and systematically comparing methods of recounting.

In summary, what individuals say during their trauma narratives (e.g., positive emotion words, negative emotion words, pronoun usage) and not the manner in which they say it (e.g., fragmentation, disorganization) may be a more powerful associate of PTSD symptoms and other trauma-related reactions. These results are clinically consistent with PTSD treatment trials that have failed to show changes of trauma narrative fragmentation associated with recovery (Foa et al., 1995; van Minnen et al., 2002). It may be that trauma-related narrative recounting seen in a variety of therapies such as cognitive processing therapy (e.g., Resick et al., 2002), exposure therapy (e.g., Foa et al., 2005), and narrative exposure therapy (e.g., Neuner et al., 2004) ought to focus on increasing emotional engagement via use of positive and negative emotion words and reducing potentially negative self-focus associated with dissociation and trauma-related guilt and not necessarily on increasing organization and decreasing fragmentation. Yet, changes in these indices prospectively have yet to be evaluated, leaving the question of the causal or mere correlate currently unanswered.

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Table 1

Means and Standard Deviations for Demographic and Psychopathology Measures

Measures	Mean	SD	Range
Demographics			
Age	23.54	10.17	18 – 57
Years of Education	13.77	2.27	8 – 22
Minority Status (% non-Caucasian)	31.4%	- -	- -
Time Since Trauma Exposure (years)	7.03	6.56	.5 – 31
Psychopathology			
PTSD Severity (PDS)	14.50	10.31	0 – 44
Reexperiencing (PDS)	3.94	12.73	0 – 12
Avoidance (PDS)	5.74	4.92	0 – 17
Arousal (PDS)	4.83	3.99	0 – 15
Depression (BDI)	12.73	9.56	1 – 36
State Anxiety (STAI-S)	45.62	13.74	22 – 77
Trait Anxiety (STAI-T)	45.51	12.31	25 – 72
Trait Dissociation (DES)	16.12	13.22	1 – 56.39
State Anger (STAXI-S)	13.83	4.91	10 – 33
Trait Anger (STAXI-T)	19.46	4.88	10 – 29
Guilt (TRGI-G)	1.62	1.09	0 – 4

Table 2

Correlations Between LIWC and NUD.IST Linguistic Variables

Linguistic Variables	LIWC							NUD.IST	
	Cog Mech	Pronouns	Neg. Emotion	Pos. Emotion	Fillers	Non-Fluency	Word Count	Fragmentation	Disorganization
Cognitive Mech	.15	-.04	.18	-.05	-.16	-.07	-.08	-.06	
Pronouns		.26	.11	-.24	-.26	-.14	-.01	.52**	
Neg. emotion			.07	.15	-.10	.03	-.25	-.12	
Pos. emotion				.28	.10	-.05	-.25	-.01	
Fillers					-.13	.26	-.16	-.38*	
Non-fluency						-.28	-.04	.03	
Word count							-.21	-.12	
NUD.IST									
Fragmentation									.30
Disorganization									

Note.

* $p < .05$;

** $p < .01$

Table 3
 Correlations Between LIWC and NUD.IST Linguistic Variables and Secondary Psychopathology Measures for Trauma Narratives

Linguistic Variables	PTSD Total	Re-exp	Avoid	Arousal	Depress. (BDI)	Anxiety (STAD)	Dissoc. (DES)	Guilt (TRGI)	Anger (STAXI)
LIWC									
Cognitive Mech	-.20	-.30	-.15	-.14	-.27	-.21	-.37*	-.02	-.08
Pronouns	-.10	-.37*	-.08	.10	.25	.25	.27	.39*	.15
Neg. emotion	-.32	-.43*	-.30	-.15	-.12	.01	-.17	.01	.18
Pos. emotion	-.38*	-.45*	-.29	-.32	-.32	-.33	-.23	-.14	-.11
Fillers	-.03	-.03	.03	-.09	-.03	-.01	-.03	.08	.03
Non-fluency	.05	.08	.01	.07	-.23	-.27	-.05	-.25	.11
Word count	.11	.21	-.05	.20	-.04	-.04	.01	.28	-.10
NUD.IST									
Fragmentation	.14	.02	.23	.04	.32	.20	.26	.18	-.06
Disorganization	-.02	-.14	-.04	.10	.10	-.03	.13	.18	-.09

Note.

* $p < .05$

Table 4

Predicting PTSD symptoms, Controlling for Daily Narrative

Variable	PTSD Total (PDS) ^{a,c}		Re-experiencing (PDS) ^{b,d}			
	B	SE B	β	SE B		
Cognitive Mechanism Words and Pronouns ^{a,b}						
Daily Cognitive Mech	1.32	1.09	.21	.13	.30	.08
Daily Pronouns	.13	.64	.04	.11	.18	.12
Trauma Distress (SUDs)	.08	.07	.20	.01	.02	.03
Trauma Cognitive Mech	-1.03	.94	-.21	-.43	.23	-.34
Trauma Pronouns	-.17	.81	-.04	-.44	.20	-.38
Positive and Negative Emotion Words ^{c,d}						
Daily Neg. emotion	6.04	3.20	.34	1.59	.86	.34
Daily Pos. emotion	-1.16	1.46	-.14	-.53	.39	-.24
Trauma Distress (SUDs)	.11	.07	.26	.01	.02	.10
Trauma Neg. emotion	-3.93	2.09	-.29	-1.53	.50	-.42 [*]
Trauma Pos. emotion	-3.28	1.35	-.36 [*]	-1.01	.32	-.42 [*]
Daily Neg. emotion	6.04	3.20	.34	1.59	.86	.34

Note.

^{*} $p < .05$;

^a Cognitive mechanism and pronoun words predicting PTSD total, $R^2 = .10$ for Step 1, $F(3, 34) = 1.09, ns$; $R^2 = .04$ for Step 2, $F(5, 34) = 0.89, ns$.

^b Cognitive mechanism and pronoun words predicting PTSD reexperiencing, $R^2 = .03$ for Step 1, $F(3, 34) = .27, ns$; $R^2 = .22$ for Step 2, $F(5, 34) = 1.89, ns$.

^c Positive and negative emotion words predicting PTSD total, $R^2 = .15$ for Step 1, $F(3, 34) = 1.78, ns$; $R^2 = .23$ for Step 2, $F(5, 34) = 3.43, p < .05$.

^d Positive and negative emotion words predicting PTSD total, PTSD reexperiencing, $R^2 = .12$ for Step 1, $F(3, 34) = 1.34, ns$; $R^2 = .37$ for Step 2, $F(5, 34) = 5.49, p < .01$.

Table 5

Predicting Dissociation and Guilt, Controlling for Daily Narrative

Variable	Dissociation (DES) ^{a,c}			Guilt (TRGI) ^{b,d}		
	B	SE B	β	B	SE B	β
Cognitive and Mechanism Words and Pronouns ^{a,b}						
Daily Cognitive Mech	1.53	1.41	.19	.02	.11	.04
Daily Pronouns	.88	.83	.19	.15	.07	.40*
Trauma Distress (SUDs)	-.04	.09	-.08	.00	.01	.01
Trauma Cognitive Mech	-2.23	1.07	-.36*	-.01	.09	-.02
Trauma Pronouns	2.23	.93	.39*	.22	.08	.47*
Positive and Negative Emotion Words ^{c,d}						
Daily Neg. emotion	4.19	4.36	.18	.69	.34	.36
Daily Pos. emotion	-.16	2.00	-.02	-.08	.16	-.10
Trauma Distress (SUDs)	-.01	.10	-.01	.01	.01	.12
Trauma Neg. emotion	-3.42	3.18	-.19	.01	.26	.01
Trauma Pos. emotion	-2.39	2.05	-.21	-.13	.17	-.14

Note.

* $p < .05$;

^aCognitive mechanism and pronoun words predicting dissociation, $R^2 = .08$ for Step 1, $F(3, 34) = .92, ns$; $R^2 = .23$ for Step 2, $F(5, 34) = 2.67, p < .05$.

^bCognitive mechanism and pronoun words predicting trauma-related guilt, $R^2 = .16$ for Step 1, $F(3, 34) = 2.02, ns$; $R^2 = .20$ for Step 2, $F(5, 34) = 3.28, p < .05$.

^cPositive and negative emotion words predicting dissociation, $R^2 = .03$ for Step 1, $F(3, 34) = .35, ns$; $R^2 = .08$ for Step 2, $F(5, 34) = .77, ns$.

^dPositive and negative emotion words predicting trauma-related guilt, $R^2 = .12$ for Step 1, $F(3, 34) = 1.40, ns$; $R^2 = .02$ for Step 2, $F(5, 34) = .92, ns$.