Forgetting to Heal: Post-traumatic stress, depression, and autobiographical memory

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Abstract

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Background: Cognitive models of mental disorders suggest that memory processing deficits, such as overgeneral and inconsistent memory, play a role in the etiology of depression (Williams et al., 2007) and posttraumatic stress disorder (PTSD; Moore & Zoellner, 2007). However, despite inconsistencies in vividness and emotional detail fluctuating with psychopathology, researchers have noted that general plot of trauma memories may remain similar (Dekel et al., 2013). However, no coding system has been developed to assess the stability of plot points over time. This prospective longitudinal study examined the relationship between PTSD, depression, overgeneral memory (OGM) and a novel measure of a memory consistency. **Method:** Seventy female undergraduates were part of an online study in which they completed the Autobiographical Memory Task (AMT; Williams & Broadbent, 1986) and measures of

posttraumatic stress (PTSD; PDS-5; Foa et al., 2016) and depression symptoms (QIDS-SR; Rush et al., 2003). They also completed a novel narrative consistency task in which they wrote about one “extremely negative” and one “extremely positive” experience within the last year at baseline and 1- month follow-up. We hypothesized that higher PTSD and depression symptoms would predict higher OGM and lower narrative consistency. **Results:** The novel narrative consistency task was associated with other commonly used measures of consistency and showed small to no correlation with OGM. Accordingly, this study demonstrates the feasibility and utility of this novel task and suggests that memory consistency operates separately from OGM. As predicted, higher PTSD and depression symptom severity predicted more overgeneral autobiographical memory at baseline and 1-month follow-up (Baseline: $\beta = -.27$, $p = .04$; 1-month: $\beta = -.33$, $p = .02$). However, higher PTSD symptomology ($\beta = .47$, $p = .05$), driven by the avoidance symptoms ($\beta = .61$, $p = .01$), predicted higher negative consistency but not positive narrative consistency across the two time points. **Discussion:** While this study confirms theories that PTSD and depression are characterized by overgeneral memory processing style (see Williams, 2007) individuals with higher PTSD severity actually had more consistent memories of negative events. These results are discussed in light of the dynamic retrieval model (Marks et al., 2018) in which retrieval of trauma memory via re-experiencing renders some aspects more likely and other aspects less likely to be retrieved or forgotten. Thus, while details fluctuate in events that are perseverated on, the general story may be rendered even more consistent.

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Autobiographical memory refers to recollections of one's life (Williams et al., 2007). According to the prevailing re-constructivist view (Loftus, 1975), autobiographical memories are continually reconstructed in accord with knowledge and experiences, attitudes, and the conditions at the time of recall. At each retrieval, memories are vulnerable to interference (Nader & Hardt, 2009). Therefore, the memory is not static but subject to change over time.

Early research on flashbulb memories for dramatic public events (e.g., Shuttle Challenger Disaster) contributed to psychodynamic theories that highly emotional memories are durable and unchanging (e.g., Talarico & Rubin, 2003). While it is generally acknowledged that an event is more vividly remembered when it is emotionally arousing (Spinhoven et. al., 2012; van Gieuzen, 2005; Voogt, et. al., 2019), a more recent theory posits that extremely negative or traumatic memories are not, in fact, extraordinary (i.e., "flashbulb"-like), but rather governed by the same mechanisms as other emotional memories (Bedard-Gilligan et al., 2017). This theory is consistent with research suggesting flashbulb memories still show evidence of inconsistency and are not always more consistent than non-flashbulb memories (e.g., Talarico & Rubin, 2007).

Even the most emotionally arousing memories, those of Criterion A traumatic events, show inconsistencies that challenge the early flashbulb memory research (van Giezen, 2005). Notably, posttraumatic stress disorder (PTSD) and other posttraumatic psychopathology such as depression potentially augment this normative inconsistency (Dekel & Bonanno, 2013; McNally, 2006; Mollica et al., 2007; Southwick et al., 1997; Zoellner et al., 2001). Understanding the extent to which psychopathology is related to and potentially drives this narrative inconsistency in emotional events is of utmost importance given the centrality of the trauma narrative in the etiology of posttraumatic psychopathology (See Rubin, 2008).

Autobiographical memory and Psychopathology

Individuals experiencing psychopathology often exhibit general memory deficits in key domains, such as working memory (e.g., Aupeperle et al., 2012; Moore et al., 2008) and retrieval (e.g., Amir et al., 2009; Storm & Levy, 2012). PTSD and depression are also firmly associated with autobiographical memory negativity biases in which individuals are more likely to recall negative events than positive events given neutral cues (Dalgleish et al., 2014; Williams et al., 2009). Other memory processing biases are included in the diagnostic criteria for PTSD and depression themselves, such as intrusive re-experiencing symptoms and concentration deficits (DSM-5; APA, 2015). These deficits may impact memory of a traumatic event, increase vulnerability for central deficits in top-down control (i.e., intrusions), fear over-generalization, and fear-maintenance (via avoidance) that predict psychopathology following strongly negative life events.

One common irregularity seen in PTSD and depression is overgeneral autobiographical memory. When instructed to recall specific memories (e.g., my 21st birthday party) to cue words (e.g., happy), individuals with autobiographical memory deficits tend to recall overgeneral memories of events, even with repeated prompting for specificity (e.g., birthday parties during my life; Williams et. al., 2007). Individuals who have PTSD and depression show overgeneral memories of both negative and positive events compared to controls, increasing with symptom severity (Barry et al., 2018; Moore & Zoellner, 2008; Rubin et al., 2011; Williams, 2007). This overgeneral style is hypothesized as a potential avoidant affect-regulating strategy or avoidant coping style that buffers against experiencing emotional pain but that impacts the vividness of positive events as well, maintaining psychopathology (Barry et al, 2018; Williams, 2007). Regardless, this overgeneral memory processing style seen in individuals with PTSD and depression may alter the specificity provided and consistency recalling details of events.

Consistency of Emotional Memory and Psychopathology.

Given that irregularities in memories of traumatic events are consistently debated (e.g., Bedard-Gilligan & Zoellner, 2012; Brewin, 2014; Rubin et al. 2016), research in memory and psychopathology has explored how psychopathological responses to trauma exposure may impact recall of highly emotional events. Early studies reported a memory "amplification" effect in which individuals with PTSD endorse a greater number of traumatic events at follow up. In a review of the relationship between symptoms of PTSD and change in recollection of trauma over time, Van Giezen et al. (2005) found PTSD symptoms were associated with augmentation in reports of traumatic memories over time. For example, veterans who reported more PTSD symptoms at follow up were more likely to have changed their answers to the questions about having experienced a traumatic event from "no" at one month to "yes" at two years compared with participants with less PTSD symptoms (Southwick et al., 1997).

Amplification of trauma memories could occur as a result of re-experiencing symptoms (King et al., 2000; Southwick et al., 1997; Koenen et al., 2007). For instance, in a study by Roemer and colleagues (1998), the number of events endorsed at a two-year follow-up was significantly correlated with PTSD re-experiencing symptoms, but not with other types of PTSD symptoms or symptoms of depression or anxiety. Another theory posits that dissociative symptoms modulate inconsistency in trauma memory (Brewin et al., 2011), highlighting a study in which rape survivors found significant gaps in memory soon after the event, but an improvement in recall three months on (Mechanic et al., 1998), possibly related to dissociative symptoms subsiding (see Zoellner et al., 2001).

In general, retrospective accounts of traumatic memories have been shown variable over time. However, the focus on consistency has thrown up awkward questions concerning what

features should be measured, how they should be measured, and what degree of consistency over what time period should characterize a flashbulb memory (Kvavilashvili et al., 2009). Naturalistic studies of memory recollections in survivors of traumatic events have used a variety of standardized questionnaires and free recall or open-ended accounts. Unsurprisingly, studies have shown discrepant findings.

Standardized Memory Questionnaires.

Studies using standardized questionnaires have consistently shown the most pronounced changes in trauma memory over time. As noted, studies of military veterans using standardized scales show that individuals experiencing elevated PTSD symptoms tend to recall increasingly greater trauma exposure over time (e.g., Dekel et al., 2016; Engelhard et al., 2008; King et al., 2000; Giosan, 2009; Southwick et al., 1997). For instance, Southwick et al. (1997) found 88% of the participants changed their responses on at least one item of a 19-item trauma exposure questionnaire; 61% changed two or more times in a reassessment at two years, positively correlated to PTSD symptom severity. Another found veterans with elevated PTSD endorsed experiencing more negative war-related experiences than they had 17 years earlier (Dekel et al., 2016). Authors hypothesized a positive feedback loop whereby traumatic memory leads to PTSD symptoms and in turn the symptoms lead to an increasingly negative recollection of the traumatic event and so forth.

Memory Narrative Studies.

A potential limitation to the above findings is that standardized questionnaires may distort the observed memory biases (Shapiro et al., 2005) as they may narrow the cognitive set, encourage responders to volunteer uncertain information (Lipton, 1977), provide misleading information (e.g., Farrar & Goodman, 1992), and, at worst, inadvertently increase inaccuracies in

reporting (e.g., Zaragoza & Mitchell, 1996). By contrast, the use of open-ended free recall allows trauma reporting to emerge freely, including thoughts, actions, feelings, and impressions, as they are organized subjectively. Unfortunately, in comparison with standardized methods, limited research exists about how trauma narratives change over time or how that change might relate to PTSD symptoms (see O'Kearney & Perrott, 2006, for a review).

Narrative Structure. Narrative memory studies have often pertained to cross sectional studies (Jaeger et al. 2014: Zoellner et al., 2001) or examined trauma memory in the context of other events, such as ongoing psychotherapy (Bedard-Gilligan et al., 2017; Foa, et al., 1995; Minnen et al., 2002). Of those who then study memory consistency, trauma narrative studies have tended to focus primarily on changes in structural abnormalities (e.g., fragmentation) rather than content (e.g., Bedard-Gilligan et al., 2017; Jaeger et al. 2014: Foa et al., 1995; Zoellner et al., 2001). In studies that have documented changes in narrative structure, the directionality of the changes and relationship to PTSD has been contradictory (see Bedard-Gilligan et al., 2017; Crespo & Fernandez-Lansac, 2016). A 2012 review by Bedard-Gilligan and Zoellner concluded that structural differences are likely better accounted for by general recounting style, rather than unique attributes of trauma memories in individuals with PTSD.

Narrative Content. While trauma narrative studies have tended to focus primarily on changes in narrative structure, narrative content such as language and valence have received far less empirical scrutiny. There does, however, appear to be evidence that PTSD symptoms are related to emotional and sensory content in traumatic memories (e.g., Bedard-Gilligan et al., 2017; Dekel & Bonanno, 2013; Jaeger et al. 2014: Zoellner et al., 2002).

Objective linguistic coding. One common way to parse narrative content over time is using a linguistic coding software. Jaeger et al. (2014) used Linguistic Inquiry and Word Count (LIWC;

Pennebaker et al., 2001) to code trauma narrative features (e.g., total word count, speech fillers, positive and negative emotion) and found use of positive and negative emotion words in trauma narratives was associated with lower PTSD re-experiencing symptoms over the course of one week of daily diary entries.

Narrative coding paradigms. Narrative coding procedures have also been used to distill narrative content. For instance, a cross-sectional study by Zoellner et al. (2002) used narrative coding procedures outlined in Foa et al. (1995) distilling "utterance units" (containing only one thought, action, or utterance) in trauma narratives. *Negative feelings* were utterances such as "I'm afraid he will kill me." *Sensations* were utterances such as "I can't see anything." Finally, *dissociative-like* were utterances such as "I feel like I am dreaming." Results showed that those with high peritraumatic dissociation included more utterances of dissociative-like content overall and negative feelings during the threat section of the narratives (Zoellner et al., 2002).

These same narrative coding procedures have found evidence that content of trauma narratives shifts over time. A study using the same coding system developed by Foa et al. (1995) to examine trauma narratives before and after treatment for PTSD (Bedard-Gilligan et al, 2017) found sensory components increased over the course of prolonged exposure (d = 0.23–0.44), potentially due to routine repetition of these details during imaginal exposure procedures.

These methods have also suggested that while trauma memories are susceptible to even extreme inconsistency over time, the plot and overall content remains generally the same. In fact, a study by Dekel and Bonanno (2013), used standardized questionnaires as well as a narrative of the traumatic event coded using the Foa et al. (1995) framework. Along with the amplification theory, the standardized trauma memory questionnaire data revealed that individuals with lower PTSD severity remembered experiencing fewer negatives events at 18 months than they had at 7

months post-9/11. Further, while one third of the narratives remained unchanged over time, when examining the linguistic categories used in consistent CUs, the authors found evidence for changes in the way information was conveyed rather than actual plot points. Another study found that veterans reported more traumatic events during reassessment on standardized questionnaires but general consistency was maintained in memory descriptions (Krinsley et al., 2003). Given these suggestions, consistency of the overall plot of event memory narratives over time is a crucial piece missing in the emotional memory consistency literature.

Plot Consistency. Despite researchers theorizing that general plot points of trauma narratives remain consistent over time, no studies have specifically examined overall plot consistency within the trauma memory literature and no coding system has been developed to assess the stability of general plot points over time. Plot consistency has instead been an object of study in forensic research, given that plot inconsistencies are often considered indicators of inaccurate recall (McNally, 2005; Talarico & Rubin, 2003) despite experimental studies showing that inconsistencies in a memory are not a strong predictor for inaccurate recall (e.g., Odinot et al., 2012).

Forensic studies corroborate aforementioned findings by Dekel and Bonanno (2013) suggesting the relative consistency of plot features over details. In an analogue study, Odinot et al. (2013) asked participants to watch videos of a car accident and then verbally report all the details they could remember in full immediately and one week later. At one week, all participants reported at least 1 item of new information, with a total of 21% percent of details having been initially unreported. However, the overall accuracy did not change across the repeated interviews. Given that plot inconsistencies are often scrutinized as indicators for

inaccurate recall, it is critical to understand typical plot consistency of highly emotional memories over time and how this relates to mental health.

Present Study

This paper explored the consistency of plot points in narratives of emotional events using a newly developed narrative consistency system. We developed a scoring protocol based on the Foa et al.'s (1995) narrative coding measure, which parses narratives into units and tracks them over time using double-coding and resolved by consensus. We then explore the relationship between this consistency and mental health indices such as PTSD and depression and other relevant memory phenomena. Specifically, we included the Autobiographical Memory Task (Williams & Broadbent, 1986) for both negative and positive memories given robust evidence of the relationship between psychopathology and overgeneral memory and because specificity may impact the consistency of memories over time. We also compared the results of this novel plot consistency coding system with other common plot consistency measures, namely rater-coded percentile ranking of narrative consistency, rater-coded categorical yes/no consistency rating, and rater-coded Likert scale of detail change over time (Dekel & Bonanno, 2013) as a means of assessing the convergent and discriminant validity of this novel coding system.

Given substantial literature demonstrating that individuals with PTSD and depression have overgeneral autobiographical memory for both positive and negative memories (see Moore & Zoellner, 2008; Williams 2007), we hypothesized that higher PTSD and depression symptoms would predict higher OGM in both positive and negative event narratives. Given research suggesting that psychopathology predicts fluctuation in detail in trauma memory (e.g., the "amplification" effect), we expected that the narratives of individuals with PTSD and depression would show less plot consistency over time, with a larger effect in negative event memories.

Method

Participants

Ninety self-identified females participated in the study. Recruitment was through the University of Washington (UW) Psychology Research Subject Pool. Participants scrolled through a list of studies (with titles and a short description) and clicked on a link that brought them to our study website. Inclusion criteria included self-reported English proficiency at least at the 9th grade level, age 18 years to 65 years. Demographic data can be seen in ***Table 1***. Participants with complete narratives (n = 78) did not differ from those with incomplete narratives (n = 12) on any key demographic variables.

Measures

Posttraumatic Stress Symptoms. Symptoms of posttraumatic stress disorder (PTSD) were assessed using the Posttraumatic Diagnostic Scale for DSM-5 (PDS-5; Foa et al., 2016), a 24-item self-report measure with items corresponding to DSM-5 diagnostic criteria for PTSD. Twenty items rated on a Likert-type scale from 0 (*not at all*) to 4 (*4-6 times a week or more/ severe*) corresponding to the 20 DSM-5 PTSD symptoms in criteria B through E are summed to create symptom severity score with higher values indicating greater PTSD severity. 4 subscales correspond with 4 symptom clusters: re-experiencing, avoidance, cognition and mood, and hypervigilance. Given that the sample was not selected for trauma exposure (scored PDS-5 = 0), PTSD severity scores were strongly positively skewed. For analyses using the PDS-5, PTSD total and cluster scores were log-transformed. The PDS has shown 82% sensitivity and 76.7% specificity, suggesting good overall diagnostic agreement with the SCID – a conventional clinical interview method of diagnosing PTSD (Williams et al., 2016). Internal consistency for the present sample was as follows: Baseline α = .93 1-month follow-up α = .85.

Depression Symptoms. Symptoms of depression were assessed using the Quick Inventory of Depressive Symptomatology – Self-Report (QIDS-SR; Rush et al., 2003), a 16-item measure of symptoms for the past 14 days on a four-point scale, with higher scores reflecting greater depression. The QIDS-SR correlated well with interviewer-rated depression (r =.86) in a psychiatric sample (Rush et al., 2003). Internal consistency for the present sample was as follows: Baseline α = .87 1-month follow-up α = .89.

Autobiographical Memory Task (AMT). To assess autobiographical memory over-generality, a standard AMT (Williams & Broadbent, 1986) was used in an online, typed format (Raes et. al, 2003a, 2006b). Participants were asked to type a specific memory in response to ten positive (e.g., happy, safe) and ten negative (e.g., angry, lonely) randomized cue words from a standardized word list (Schoenfeld & Elhers, 2006). Participants were given 1 min per cue to retrieve a specific autobiographical memory. Each response was rater-coded for specificity (specific and non-specific; Williams & Broadbent,1986). Positive and negative specificity scores were derived and also combined into a total % of specific memories (Williams & Broadbent, 1986), with higher specificity being considered more adaptive. Online formats of the AMT show good reliability and convergent validity to written formats (r = .55 - .91; Raes et al., 2003).

Autobiographical Event Recall. Two narratives are queried: one "extremely good" and one "extremely bad" experience within the last year (i.e. "the most negative and positive personal experiences that have occurred in the last year"). Instructions directed participants to describe the event for 5 to 10 minutes. The prompt included: "Write as many details as you can recall about that event. What happened? How did it make you feel? What were you thinking/saying to yourself? Include any particularly vivid details." They were told if they "cannot remember many details, just try to be as specific as possible." For both memories,

participants were given unlimited space to write but responses were cut-off at 10 minutes. They were then prompted to provide a 5-word descriptive title (e.g., “Finding out my cat died.”). At 1-month follow up (T2), participants were asked to “Describe, as specifically as you can, about "[title]"). Of narratives of negative (n = 90) and positive events (n = 90) reported, 14 negative and 18 positive were removed because of technical errors (e.g., did not receive the title of their narratives at the second time point), one negative and two positive were removed for missing data (i.e., narratives cut off prematurely due to computer issues), and eight negative and six positive were removed because participants did not follow task directions (e.g., wrote about an experience in the last week at T2). Thus, 69 negative and 67 positive events narratives were used in the final analysis. There was no difference in the likelihood of negative or positive events being excluded from analyses.

***Consistency Coding System*.** Our primary metric of consistency was calculated using a scoring protocol developed for this study based on Foa et al. (1995) and Dekel and Bonanno (2013) to parse narratives into units. Units were defined as the smallest segment of text that conveyed meaningful information, usually pertaining to a thought, feeling, action, description, or detail (e.g., “I feared for my life,” “I blacked out”). These units were tracked over time, using double coding and discrepancies resolved by consensus. The protocol was tailored to track plot shifts over time. Raters coded the number of baseline “major plot points,” plot points that appeared again at 1-month, and novel plot points that first appeared at 1-month follow-up. Plot points were defined as higher order themes or moments in the narrative that come across strongly but that don’t necessarily rely on exact language in text or repetition. For instance, a plot point would combine "removing his hand" and "moving away" into the single plot point of conveying active protest. As such, plot points were counted as consistent despite different wordings and

number of sentences spent on them. In addition to actions (e.g. “I went to a birthday party,” and “my friends ended up leaving early”) plot points also could incorporate key emotions or details like “I was uncomfortable.” Six raters were trained to reliability *(r* > .80) on a set of 20 example narratives. Narratives were each double-rater coded for plot points and conflicts were resolved at weekly meetings of the first author and all six raters. Consistency was calculated by the following equation: (#baseline plot points at T2/ #baseline plot points) – (#novel plot points at T2/ #baseline plot points). Higher scores reflect greater consistency. In this sample, across raters, there was high inter-rater reliability (*r* = .92).

***Other metrics of narrative consistency*.** As a means of comparison to our novel consistency task and to ascertain general impressions of narrative consistency by the raters, we included a rater-coded questionnaire of narrative consistency used in other studies (e.g., Dekel et al., 2016; Southwick et al., 1997). Raters were asked to report a percentile ranking of subjective consistency (“*On a scale of 0-100, how consistent is this narrative over the __ time points?”)* and a Likert-type scale of detail change over time from 0 (*details were the same, to the point of replication*) to 3 (*details were extremely different to the point of shifting plot points*). Raters were also asked to provide a categorical yes/ no endorsement of the prompt: “*This narrative showed no notable inconsistencies.*” Six raters were trained to reliability on these questions (*rs* > *.80*) using a set of 20 example narratives. Narratives were each double-rater coded on each of these metrics and conflicts were resolved at weekly meetings of the first author and all six raters. Each of these consistency measures were double-rater coded and showed an inter-rater reliability of *r*s > .89.

Standardized Consistency Questionnaire. Modeled on standardized consistency questionnaires in which participants are asked the same questions about events at multiple time

points (e.g., Dekel et al., 2016; Giosan, 2009; Southwick et al., 1997). Participants were asked four questions about the extremely negative and positive events about which they wrote narratives: 1) *On which day of the week did this event occur?* 2) *What was the weather like that day?* 3) *What were you wearing?* and 4) *Were you, or anyone else at/involved in this event, drinking alcohol?* Two raters coded answers to questions at T1 and T2 as "consistent," "inconsistent," or "missing."

Procedure

Via the study website, participants used an online form to schedule a consent meeting with a member of our team in which they were oriented to the study protocol and gave informed consent for study participation. Participants completed an online test battery examining the relationship among memory specificity, consistency, and mental health indices over time. Specifically, at baseline and one month follow-up, participants completed the AMT (Williams, et al., 2006), autobiographical event recall task where participants were asked to write two narratives: one "extremely negative" and one "extremely positive" experience within the last year, and measures of posttraumatic stress (PTSD; PDS-5; Foa et al., 2016) and depression severity (QIDS-SR; Rush et al., 2003). Demographic information (e.g., age, ethnicity, racial identity, gender identity) was only assessed at baseline. Counterbalancing of tasks, questionnaires, and stimuli (e.g., AMT cue words, negative vs. positive event narratives) was used to minimize carry-over effects. Participants received course extra credit at baseline and $20 at 1 month.

Data Analytic Strategy

General descriptive information on narrative consistency was examined, comparing narrative valence (positive, negative) and time effects (baseline, 1 month follow-up). Pearson's correlation

coefficients were calculated and used to ascertain divergent and discriminant validity of the AMT and each consistency metric. Standard linear regressions were used to assess the relationship between memory indices and mental health symptoms. To examine the relationship between baseline psychopathology and narrative consistency, three main sets of analyses were examined: (1) baseline PTSD total severity and cluster severity predicting narrative consistency; (2) baseline depression symptoms predicting narrative consistency; and (3) baseline overgeneral memory specificity predicting narrative consistency. To examine the relationship between psychopathology and memory specificity, two sets of analyses were examined: (1) PTSD symptoms predicting overgeneral memory and (2) Depression symptoms predicting overgeneral memory. All models were tested with pairwise deletion to account for missing variables. Analyses were conducted in SPSS version 26.

Results

Narrative Characteristics

Length. The length of narratives of negative and positive events at baseline and 1-month follow up are presented in ***Table 2.*** Using a narrative type (negative, positive) x time (baseline, 1 month) repeated measures ANOVA, there was a main effect of type, $F(1,76) = 14.90$, $p = .00$, with negative events being longer ($M = 163.43$, $SD = 9.31$) than positive events ($M = 137.64$, $SD = 8.35$), $d = 0.26$. There was no effect of time or type by time interaction.

Rater-coded impressions of participants writing styles (including length and narrative detail; ***Table 2***) showed that 50.0% of the narratives were rated as detailed. Positive narratives showed slightly greater incidents reflecting either “brisk writers” or were “seemingly rushed” (46.3%) than negative narratives (20.3 %), although these differences were not significant. Raters coded that 20.3% of negative and 25.4% of positive narratives changed substantially in

length from baseline to 1-month follow up.

Developed Plot Point Consistency Coding. Figure 1 presents a histogram of consistency scores for negative and positive event narratives using the plot point consistency coding developed for this study. Higher scores reflect higher consistency with the range of scores from 0-100. Participants showed generally strong memory consistency (range = 0-100, negative: M = 75.5, SD = 30.1). Age was not related to plot point consistency.

At baseline, negative narratives had more plot points than positive narratives, although not significantly (see ***Table 3***). About one new plot point emerged at 1-month follow up for both negative and positive event narratives. On average, negative narratives showed greater plot point consistency between baseline and follow-up than positive narratives with an average of 3.38 (SD = 1.61) consistent plot points compared to 2.95 (SD = 1.58) for positive narratives ($t(68) = 3.10$ p = .04, 95% CI [0.57, 0.83] d = 0.11).

Rater-Coded Subjective Consistency Ratings. Key indices of self-report and subjective rater-coded impressions of consistency between baseline and 1-month are also presented in ***Table 3***. Of 136 narratives examined in this study, 69.9% (n = 95) were rated by coders as having "no notable inconsistencies." A rater-coded percentile ranking of general consistency showed a normal distribution of scores (range = 0-100, M = 56.63, SD = 36.68). Similarly, the mean subjective rater-coded percentile ranking of consistency of narratives was slightly higher than 50% for both negative and positive narratives. Details were generally more inconsistent than the plot (Likert rating 1.72 of 3). There were no significant differences between negative and positive narratives on these indices. These findings indicate that raters perceived the majority of narratives to be consistent over the two timepoints, despite noting fluctuations in details.

Standardized Consistency Questionnaire. The percent of participants who consistently (at

baseline and 1-month follow-up) answered each question on the standardized consistency questionnaire are presented in ***Table 3***. The questions that were answered with the highest consistency were "which day of the week did this event occur?" and "was there alcohol at the event?" Participants were least consistent in reporting what the weather was like on the day of the event. None of these relationships were significant.

Convergent Validity Across Consistency Measures

Bivariate correlations among the developed objective plot point consistency coding, rater-coded subjective impressions plot consistency and consistent responses to questions on the standardized consistency questionnaire are presented in ***Table 4***. The developed plot point consistency coding strongly correlated with other measures of rater-coded subjective impressions of consistency: positively with percentile ranking of consistency; negatively with Likert scale scores of detail shifts; and positively with endorsement of general consistency ("*no notable inconsistencies")*.

Conversely, there were no strong correlations between objective negative or positive narrative plot point consistency coding and standardized consistency questions in answering, with the exception of a moderate association between plot point consistency and what they were wearing for both negative (r = .25, p = .03) and positive (r = .33, p = .02) events. Together, the novel plot point consistency coding strongly correlated with subjective rater-coded impressions of consistency but did not correlate strongly with the standardized consistency questionnaire.

Baseline Autobiographical Memory Task Performance

The mean baseline AMT score (% specificity) was 68.5 (SD = 15.3) with the range of scores from 0-100. Higher scores reflect more specific autobiographical memory. Distribution of AMT scores was negatively skewed, reflecting that most of the sample had specific memory. Age and

baseline AMT score were not significantly correlated.

Baseline Correlations Among Memory Consistency, Specificity, and Mental Health Measures

Bivariate correlations among the developed objective plot point consistency, AMT scores, posttraumatic stress, and depression at baseline are presented in ***Table 5***. As would be expected, measures of mental health, including PTSD and subscales and depression, were strongly correlated. PTSD and depression were not strongly correlated with memory specificity at baseline. Notably, higher negative narrative event memory consistency was strongly correlated with higher PTSD symptom severity, and particularly avoidance, while positive event memory consistency was not strongly correlated with PTSD or depression severity. Finally, autobiographical memory specificity at baseline was not correlated with objective plot point consistency for either negative or positive memories. In sum, measures of mental health correlated with each other and with the novel plot consistency coding, but not with AMT scores.

Baseline Mental Health Predicting Lower Memory Consistency

A linear regression between baseline PTSD symptom severity (PTSD total, re-experiencing, avoidance, cognition/mood, and hyperarousal) and the developed objective plot point consistency showed that higher baseline PTSD symptom severity predicted higher negative event consistency ($\beta = .60$, $t(19) = 3.15$, $p = .00$) but not positive event narrative consistency ($\beta = .27$, $t(19) = 1.19$, ns) across the two time points. See ***Figure 2*** for a visualization of this relationship. This effect was driven by the avoidance symptom subcluster ($\beta = .71$, $t(17) = 4.01$, $p = .00$). A linear regression showed that baseline depression symptom severity did not significantly predict plot point consistency for either negative ($\beta = .16$, $t(60) = 1.27$, ns) or positive narratives ($\beta = .01$, $t(60) = 0.61$, ns). In sum, higher PTSD but not depression severity predicted plot point

consistency.

Baseline Mental Health Predicting Lower Autobiographical Memory Specificity

Two separate (baseline and 1-month) linear regressions between depression symptom severity and AMT scores showed that higher depression symptom severity predicted more overgeneral autobiographical memory (i.e., low AMT scores) at baseline and 1-month (Baseline: $\beta = -.40$, $t(57) = -1.98$, $p = .002$; 1-month: $\beta = -.27$, $t(57) = -1.01$, $p = .04$). Two separate linear regressions (baseline and 1-month) between PTSD symptom severity (PTSD total, re-experiencing, avoidance, cognition/mood, and hyperarousal) and AMT scores showed that higher PTSD symptom severity predicted more overgeneral autobiographical memory at baseline and 1-month (Baseline: $\beta = -.54$, $p = .01$; 1-month: $\beta = -.33$, $p = .03$) See ***Figure 2*** for a visualization of these relationships. In sum, higher PTSD and depression severity predicted memory specificity.

Discussion

This study was conducted to address the dearth of literature on the consistency of general plot points of highly emotional memory narratives over time and how this consistency relates to mental health. First, this study presents the feasibility and utility of a novel plot consistency coding system. Using this coding scheme, consistent with Odinot and colleagues (2013) and Dekel and Bonanno (2013), highly emotional memory remained generally, but not perfectly, consistent over time. This is notable given that the vast majority of literature on shifts in emotional memory over time has highlighted inconsistency of details and language, particularly in individuals with higher PTSD and depression symptoms, but not measured the consistency of the overall plot. For negative events, greater memory consistency across baseline to one month follow-up was actually related to higher PTSD symptoms, particularly avoidance. These results

disconfirm our hypothesis that psychopathology would be associated with greater memory inconsistency overall given its negative relationship with consistency of details and valence. However, these results are consistent with the dynamic retrieval model (Marks et al., 2018) such that re-experiencing of and rumination on negative events renders some aspects likely to be retrieved in the future and other aspects, such as details, less likely to be retrieved or forgotten. Finally, findings that AMT scores were not related to memory consistency suggests a separate mechanism underlying autobiographical memory specificity and consistency.

Despite significant literature showing fluctuations in details in the emotional memories of individuals with higher PTSD symptoms, little attention has been devoted to understanding the overall plot emotional consistency of memories over time in individuals experiencing psychopathology. As such, no coding system has been developed to assess the stability of general plot points over time. This study presents a novel scoring protocol, which parses narratives into units and tracks them over time. Results highlight the feasibility and utility of the novel plot point consistency task, showing strong inter-rater reliability and convergent validity with other indices of consistency. Further, this metric did not strongly correlate with other autobiographical memory specificity, suggesting that the construct of memory consistency operates separately from memory specificity.

Memory narratives showed generally strong plot consistency using both the novel consistency coding system as well as rater-coded subjective assessments of consistency. These findings augment theories posed by previous work in forensic studies (Odinot et al., 2013) and traumatic stress studies (Dekel & Bonanno, 2013; Krinsley et al., 2003). Specifically, Dekel and Bonanno (2013, p. 12) noted inconsistency was found “in the way information was conveyed rather than actual plot points.” This study explicitly tested this suggestion by creating a novel

plot point consistency coding system and confirmed that while details may fluctuate, emotional memories nonetheless retain much of their initial qualities over time.

Negative narratives showed slightly greater plot point consistency using the developed consistency coding but showed no difference in rater-coded subjective impressions of consistency. Consistent with the literature that negative event narratives are often longer (Bohanek et al., 2005; Fernandez-Lansac & Crespo, 2015), at baseline, negative narratives had slightly more words and plot points than positive narratives, although not significantly and, on average, one new plot point emerged at 1-month follow up for both negative and positive event narratives. The similar number of new plot points may have been diminished by the higher total number of plot points for negative narratives. In other words, greater negative narrative inconsistency may be related to the fact that negative events often had more content to be remembered over time. Notably, negative and positive narrative consistency are only modestly associated and not at a significant level. This suggests shared but largely separate positive and negative processing within each individual.

Individuals with higher PTSD symptom severity had more consistent memories of highly negative events than those with lower symptom severity, with a robust effect. This was not the case for positive events. Initially, this finding may seem contradictory to studies indicating that individuals experiencing elevated PTSD symptoms tend to recall increasingly greater, more emotionally intense, trauma exposure over time (e.g., Dekel et al., 2016; Engelhard et al., 2008; Giosan, 2009; King et al., 2000; Southwick et al., 1997). However, this study is consistent with Dekel and colleagues' (2016) interpretation that while inconsistencies are found in valence and reporting style (sensory and cognitive components, etc.), participants describe the same general plot at each time point. Further, heightened consistency of the plot of negative memories in

individuals with higher PTSD symptom severity may be related to the Marks et al. (2018) dynamic retrieval model of intrusions. This model posits that repeated retrieval of specific aspects of the trauma memory via re-experiencing symptoms renders those aspects more likely to be retrieved in the future while other aspects of the trauma memory not re-experienced are rendered less likely to be retrieved or forgotten. Thus, while details or valence fluctuate largely in negative events that are re-experienced or ruminated on, the general story of an event is rendered even more consistent. With this model in mind, it is unsurprising that literature examining consistency of memories for negative events have found vast fluctuations in details and emotional content in individuals with higher PTSD symptom severity, but that our study found that plot of negative events is even more consistent in this group.

There were no strong associations between subjective rater-coded impressions nor plot point consistency coding and consistency on the standardized event questionnaires. This is consistent with literature showing that open-ended free recall reporting gathers different information than standardized questionnaires regarding the same event memory. Consistency on standardized questions may align more with other factors, such as natural relevance of the question to the memory (e.g. weather may be easier to remember for memories that take place outdoors than indoors). For instance, in our sample, consistency in answering what participants were wearing during the event moderately correlated with consistency of answers to the weather the day the event occurred, which is logical given weather and clothing are related concepts. These results that consistency on standardized questions were not related to other metrics of consistency but instead related to potential third variables call into question the validity of using standardized questionnaires as a metric of event memory consistency.

The Autobiographical Memory Task (Williams & Broadbent, 1986) was included for both

negative and positive memories given that it is the gold-standard measure of memory specificity and given the robust evidence of the relationship between psychopathology and overgeneral memory. This study is consistent with theories that PTSD and depression symptom severity are strongly associated with an overgeneral memory processing style (Barry et al., 2018). The AMT was also included because low memory specificity may impact the consistency of memories over time in individuals with PTSD and depression symptoms. However, scores on the AMT were not associated with memory consistency. This lack of correlation suggests there may be separate autobiographical memory processes dictating memory specificity versus consistency. As such, our findings do not support the theory that inconsistencies seen in individuals with higher PTSD and depression symptoms are due to their overgeneral autobiographical memory processing style.

Practical Implications

These findings hold several implications for clinical practice. Cognitive models of mental disorders suggest that memory processing deficits may play a role in the etiology of depression (Williams et al., 2007) and posttraumatic stress disorder (PTSD; Moore & Zoellner, 2007). First, the overgeneral style associated with PTSD and depression symptom severity is hypothesized as a potential avoidant coping style that buffers against experiencing emotional pain but that impacts the vividness of positive events as well, maintaining psychopathology (Barry et al, 2018; Williams, 2006). Further, heightened consistency of the plot of negative memories in individuals with higher PTSD symptom severity may be due to the re-experiencing of memories via intrusions and rumination on negative events rendering some aspects of the event more likely to be retrieved and other aspects, such as details, more likely to be forgotten. Targeting these memory processing biases by encouraging perseveration on or “savoring” of positive events and

challenging of inflexible maladaptive beliefs related to negative events may increase cognitive flexibility and positive affect for individuals with PTSD and depression (Craske et al., 2016).

In addition to implications for clinical practice, these findings hold several implications for legal practice. Many individuals who have experienced highly emotional negative events and are experiencing posttraumatic stress symptoms interact with the justice system through witness testimony. The standardized questions asked in this study (e.g., “What were you wearing that day?”) were intended to mirror common questions asked of individuals who have experienced a sexual assault; one of the events most likely to result in PTSD (Kessler, 2017; Kilpatrick et al., 2013). Previous work has shown answers to these questions are particularly prone to inconsistencies, particularly in individuals with higher PTSD and depression symptoms, and particularly for negative events (e.g., Dekel & Bonanno, 2013, Southwick et al., 1997). Our findings further that work by suggesting that consistency on these standardized questions were not related to other measures of consistency. Results thus suggest that these common questions asked of survivors could yield inconsistent responses and may misrepresent the true consistency of individuals' memories for events.

Much attention has been given to common inconsistencies in details in emotional narratives over time in individuals with PTSD (e.g., Bedard-Gilligan et al., 2017; Dekel & Bonanno, 2013; Dekel et al., 2016; Giosan, 2009; Jaeger et al. 2014; Zoellner et al., 2002; Southwick et al., 1997). The findings of this study add to this literature in suggesting that while it is reasonable to expect detail and recounting inconsistencies in repeated event recall, particularly in individuals experiencing event-related stress, larger plot inconsistencies are less common. Thus, weight put on details in testimony should be shifted to the notable consistency of the actual plot. This

refocusing could very well benefit survivors of highly emotional events who are asked to testify repeatedly on their account of the event.

Limitations and Directions for Future Research

Several methodological limitations should be noted. The inevitable attrition and data loss between assessments in longitudinal studies should be taken into account. While the reasons for attrition and data loss varied, the follow-up sample did not differ from the initial one in demographic or main study variables. Additionally, the event narratives were written rather than verbally recounted through an interview. Narratives may have been shorter and less detailed than in verbal recounting to another individual. This effect is suggested by the slight, although not significant, decrease in length of memories between baseline and one-month follow-up, where participants may have been hurried or impacted by testing effects (e.g., tiring). Also, self-report measures, rather than clinical interviews may result in overreporting of symptoms (Stevens, et al., 2013). Both the PDS-5 and QIDS-SR show good validity with diagnostic interview measures (Cameron et al., 2013; Williams et al., 2016). These limitations come in exchange for the ability to gather narrative memory data in a larger sample than is often typical in this literature (Bedard-Gilligan et al., 2017; Dekel & Bonanno, 2013; Dekel et al., 2016; Foa et al., 1995; Jaeger et al. 2014; Zoellner et al., 2002).

Notably, there was a relatively small sample size of higher scores on each psychopathology measure. The modal response on the psychopathology measures was zero, arguing that observed effects may be even more pronounced in clinical samples, though replication in clinical samples is needed. Further, the narrative consistency coding, which had good reliability and was based on the most widely used coding (Foa et al., 1995), was developed for this study due to lack of relevant measures and variability in narrative consistency measures. Thus, more studies in

diverse, clinical, samples are needed to further validate the utility of this measure and bolster the findings in this study. In this prospective methods study, we are applying consistency coding methods to extremely positive and negative memories in a large, non-clinical sample with the hopes of applying these methods to trauma narratives. Specifically, understanding trauma narrative consistency could de-stigmatize normative narrative inconsistency, particularly in contexts when interacting with repeated questioning via witness and victim testimony.

Finally, memory deficits associated with psychopathology may interact with and exacerbate each other. For instance, working memory is critical to overall memory functioning (D'Esposito et al., 2000), and poorer WMC has been shown to be associated with both impaired contextual processing (e.g., Holden et al., 2020) and overgeneral autobiographical memory (Raes et. al., 2006). The memory effects observed in this study may have been present before events occurred and study commenced. Ideally, a true baseline would have been recorded, prior to the experience of any extremely negative or positive event or the advent of psychopathy. Tracking longitudinal and pre-event memory processing is crucial to understand the dynamic nature of these deficits and their potentially bi-directional relationship with psychopathology. At present, this is not represented in the evidence base. A robust understanding of memory processing and psychopathology may lead to integrative models of posttraumatic vulnerability to better target prevention and treatment efforts.

Conclusions

The present study provides evidence for the consistency of general plot points across memories for extremely negative and positive events over time. Little attention has been devoted to this line of inquiry within the emotional memory literature and no coding system has been developed to assess the stability of general plot points over time. This study addressed this gap in

the literature by proposing a novel memory narrative coding system that assesses plot consistency over time. We then used this system to provide nuance to the literature on memory consistency that, while details and valence may shift over time, overall memory remains relatively consistent. Finally, our findings provide novel evidence that PTSD symptom severity may be related to particularly consistent memories of negative events. This may provide a novel example of the Marks et al. (2018) dynamic retrieval model whereby perseveration on or re-experiencing of negative events via intrusions renders some aspects more likely to be retrieved in the future. These findings hold clinical implications as they point to intervention opportunities targeting negative memory processing biases in individuals experiencing posttraumatic psychopathology.

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Table 1. *Demographic Characteristics (N = 78).*

	M (SD)	**Range**
Age (years)	18.70 (*0.91*)	18-23
College year		
First Year	74.3%	
Second Year	21.4%	
Ethnicity (%)		
Asian	54.3%	
White	32.9%	
Black or African American	4.3%	
Other	8.5%	
Baseline PTSD Severity (PDS-5)	6.45 *(14.18)*	0-65
Baseline Depression Severity (QIDS-SR)	8.41(4.83)	1-20

Note. QIDS: Quick Inventory of Depressive Symptomatology – Self-Report (QIDS-SR; Rush et al., 2003). PDS-5: Posttraumatic Diagnostic Scale for DSM-5 (PDS-5; Foa et al., 2016). Depression on specificity regression (n = 62), PTSD on consistency regression (n = 23)

Table 2. *Length of positive and negative narratives and rater-coded impressions of narrative writing styles at baseline and 1-month (N = 78).*

	Baseline		**One Month**	
	Negative (M/*SD*)	**Positive (M/*SD*)**	**Negative (M/*SD*)**	**Positive (M/*SD*)**
Word Count	131.56 *(91.07)*	108.90 *(86.52)*	122.49 *(98.30)*	99.68 *(78.61)*
	Negative		**Positive**	
Rater coded:				
Detailed writers (%)	34 (*49.3*)		34 (*50.7*)	
Brisk writers (%)	10 (*14.5*)		24 (*35.8*)	
Seemingly rushed (%)	4 (*5.8*)		7 (*10.5*)	
Substantial change in length (%)	14 (*20.3*)		17(*25.4*)	

Note. Negative: *n* = 69. Positive: *n* = 67.

Table 3. *Findings of the novel narrative plot consistency coding system, subjective rater-coded consistency, and the standardized consistency questionnaire (N=78).*

	Negative *M* (*SD*)	**Positive** *M* (*SD*)
Novel plot point consistency coding		
Consistency	62.12 (*31.37*)	58.59 (*32.32*)
Number of plot points at baseline	4.67 (*0.90*)	4.29 (*0.86*)
Major new plot points at 1-month	1.02 (*1.08*)	0.74 (*0.80*)
Number of consistent plot points	3.38 (*1.61*)	2.95 (*1.58*)
Self-report and subjective rater-coding of consistency		
Self-Report		
Forgot what wrote (*%*)	4 *(5.8*)	1 (*1.5*)
Rater Coded:		
Percentile ranking of consistency (0-100)	54.75 *(25.71)*	57.25 *(19.06)*
Likert rating of detail shifts (0-3)	1.46 (*0.87*)	0.77 (*0.78*)
"*no notable inconsistencies****"****(%)*	46 (66.7)	49 (*73.1*)
Standardized consistency questionnaire		
"What was the weather like that day?"	59.65%	57.63%
"Which day of the week did this event occur?"	73.68%	76.27%
"What were you wearing?"	58.92%	71.19%
"Was there alcohol at the event?"	87.71%	86.44%

Note. Negative: *n* = 69. Positive: *n* = 67. Consistency: Novel narrative plot point consistency coding system. Raters were asked to report a percentile ranking of subjective consistency ("*On a scale of 0-100, how consistent is this narrative over the __ time points?")*, a Likert-type scale of detail change over time from 0 (*details were the same, to the point of replication*) to 3 (*details were extremely different to the point of shifting plot points*), and to provide a categorical yes/ no endorsement of the prompt: "*This narrative showed no notable inconsistencies.*"

Table 4. *Bivariate correlations between measures of rater-coded subjective consistency ratings and the standardized consistency questionnaire with the novel plot point consistency coding system (N = 78).*

Rater-coded consistency ratings

Negative	**1.**	**2.**	**3.**	**4.**
1. Consistency	-			
Rater-Coded:				
2. Percentile ranking of consistency (0-100)	.85**	-		
3. Likert scale of detail shifts (0-3)	-.85**	.82**	-	
4. "no notable inconsistencies"	.42**	.50**	.59**	-
Positive	**1.**	**2.**	**3.**	**4.**
1. Consistency	-			
Rater-Coded:				
2. Percentile ranking of consistency (0-100)	.72**	-		
3. Likert scale of detail shifts (0-3)	-.78**	.86**	-	
4. "no notable inconsistencies"	.48**	.61**	.73**	-

Standardized consistency questionnaire

Negative	**1.**	**2.**	**3.**	**4.**	**5.**
1. Consistency	-				
Standardized Consistency Questionnaire:					
2. "What was the weather like that day?"	.22	-			
3. "Which day of the week did this event occur?"	.18	.19	-		
4. "What were you wearing?"	.25*	.13	.33*	-	
5. "Was there alcohol at the event?"	.04	.09	.10	.11	-
Positive	**1.**	**2.**	**3.**	**4.**	**5.**
1. Consistency	-				
Standardized Consistency Questionnaire:					
2. "What was the weather like that day?"	.11	-			
3. "Which day of the week did this event occur?"	.14	-.04	-		
4. "What were you wearing?"	.45**	.33*	-.35**	-	
5. "Was there alcohol at the event?"	.04	.11	.07	.04	-

Note. *$p < .05$ **$p < .01$. Negative: $n = 69$. Positive: $n = 67$. Consistency: Novel narrative plot point consistency coding system. Raters were asked to report a percentile ranking of subjective consistency ("*On a scale of 0-100, how consistent is this narrative over the __ time points?")*, a Likert-type scale of detail change over time from 0 (*details*

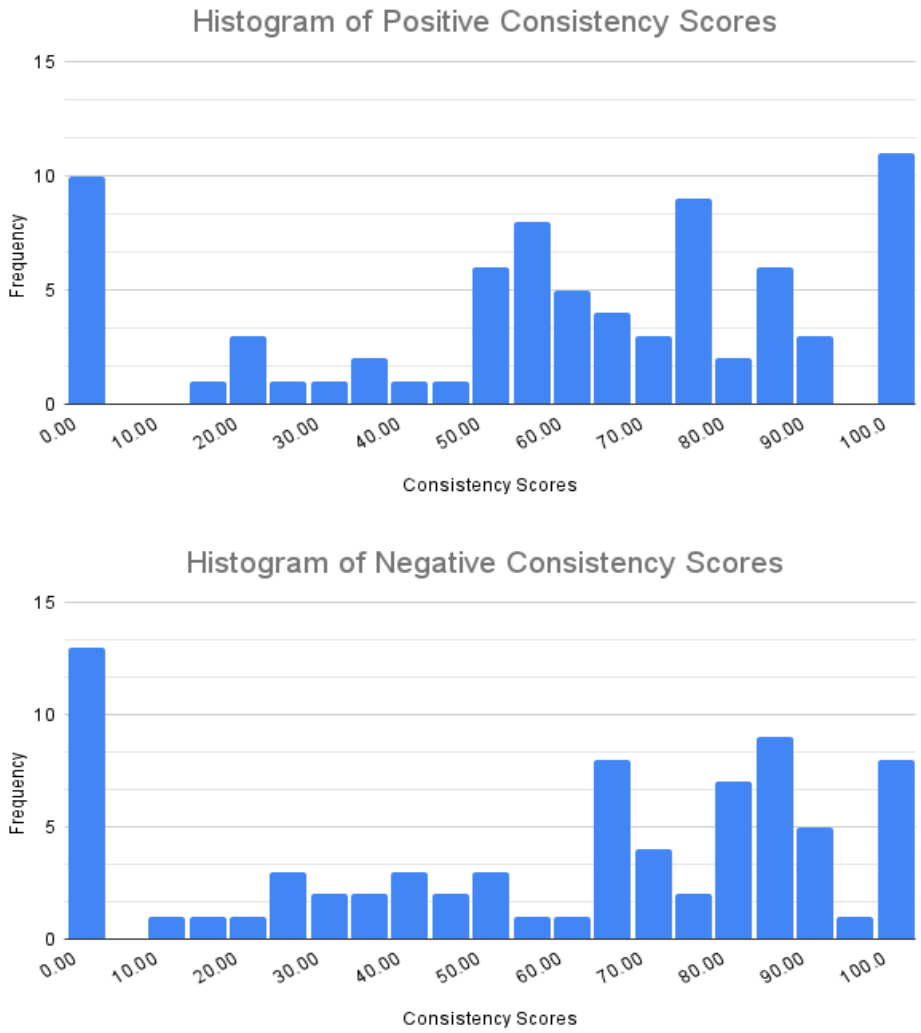
were the same, to the point of replication) to 3 (*details were extremely different to the point of shifting plot points*), and to provide a categorical yes/ no endorsement of the prompt: "*This narrative showed no notable inconsistencies.*"

Table 5. *Bivariate correlations among, AMT specificity scores, plot point consistency, posttraumatic stress symptoms, and depression symptoms at baseline (n = 62)*

	1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	***a***	***b***	***c***	***d***
1. Consistency Negative	-										
2. Consistency Positive	.19	-									
3. AMT Specificity	.05	.18	-								
4. AMT Negative	-.00	.00	.73**	-							
5. AMT Positive	-.02	.10	.71**	.60**	-						
6. Depression (QIDS)	.24*	.09	-.20	-.07	-.17	-					
7. PTSD (PDS-5)	.60**	.15	-.15	-.19	-.18	.47*	-				
a. **Re-experiencing**	.47*	-.15	-.20	-.20	-.22	.42*	.80**	-			
b. **Avoidance**	.71**	.11	-.19	-.19	-.25	.53*	.77**	.78**	-		
c. **Cognitions and Mood**	.48*	.24	-.26	-.24	-.30	.59**	.89**	.63**	.76**	-	
d. **Hyperarousal**	.38	.10	-.13	-.20	-.17	.61**	.84**	.55*	.57*	.89**	-

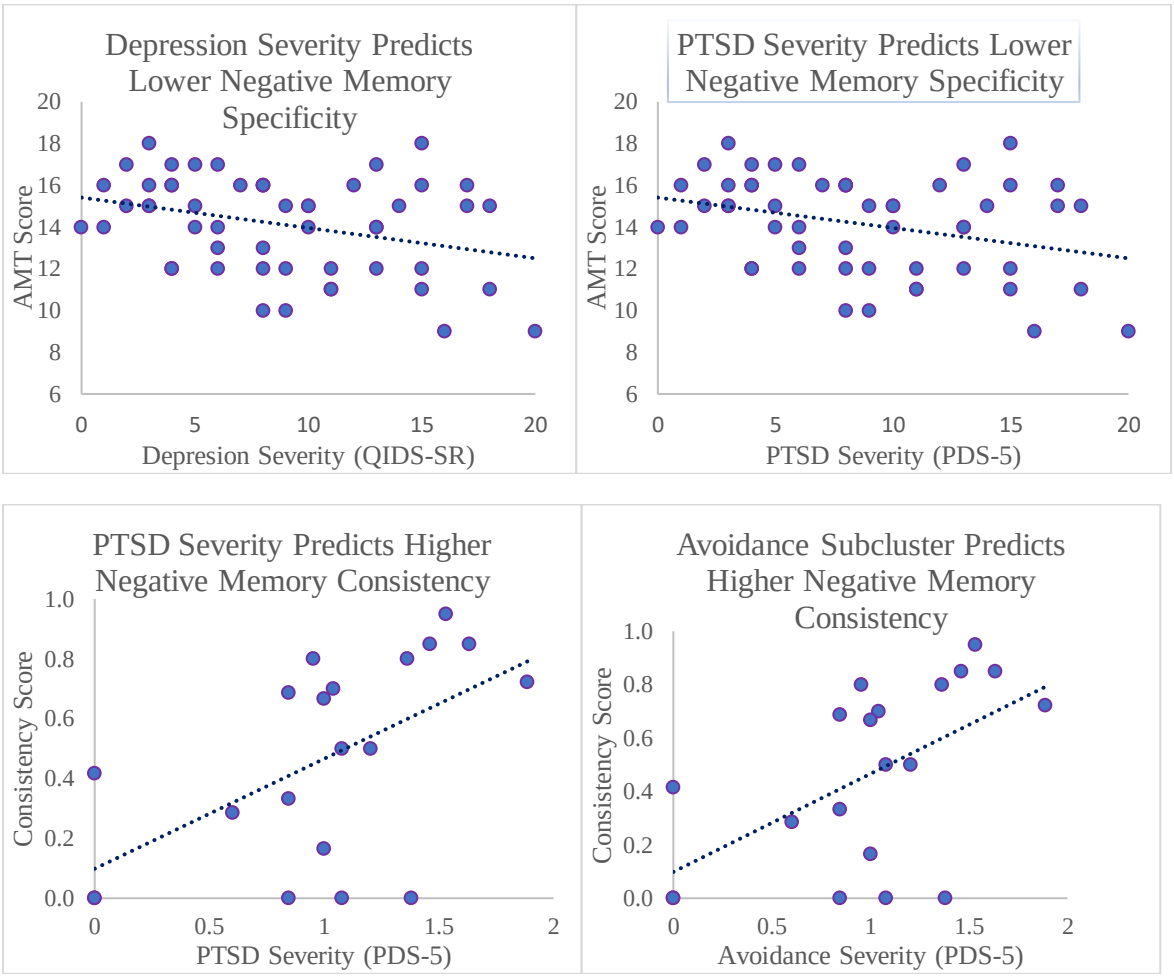
Note. *$p < .05$ **$p < .01$. Consistency Negative/Positive: Novel narrative plot point consistency coding. AMT: Autobiographical Memory Task (Williams & Broadbent, 1986). QIDS: Quick Inventory of Depressive Symptomatology – Self-Report (QIDS-SR; Rush et al., 2003). PDS-5: Posttraumatic Diagnostic Scale for DSM-5 (PDS-5; Foa et al., 2016).

Figure 1. *Histograms of negative and positive consistency scores.*



Note. Consistency: Novel plot point consistency coding system. Negative: n = 69. Positive: n = 67.

Figure 2. *Baseline mental health symptom severity predicted memory specificity and consistency.*



Note. Consistency: Novel narrative plot point consistency coding. AMT: Autobiographical Memory Task (Williams & Broadbent, 1986). QIDS: Quick Inventory of Depressive Symptomatology – Self-Report (QIDS-SR; Rush et al., 2003). PDS-5: Posttraumatic Diagnostic Scale for DSM-5 (PDS-5; Foa et al., 2016). Depression scores regressed onto AMT scores (n = 62), PTSD scores regressed onto AMT scores and consistency (n = 23).