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# Examining the factor structure of narrative meaning-making for stressful events and relations with psychological distress

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**ABSTRACT**

This study examined the underlying factor structure of 15 narrative meaning-making indices for narratives of stressful events, and explored the incremental validity of the narrative factor solution over and above general personality traits in predicting various indices of psychological well-being. Two-hundred and twenty four undergraduates ($M_{age}$ = 19.2 years, $SD_{age}$ = 2.1; 114 males and 110 females; 67.6% Caucasian, 12.0% East Asian, 7.6% African-American, 4.0% South Asian, 2.2% Hispanic, and 6.7% as mixed or Other origin) wrote about the most traumatic experience in their life, and completed a series of psychological questionnaires. The narratives were coded in 15 ways theoretically derived from the narrative meaning-making literature. A series of exploratory structural equation models indicated that a four-factor solution best approximated the data. The four factors were: positive processing, negative processing, integrative meaning, and structure. All four factors related differentially to indices of well-being over and above traits. There appear to be four distinct, but related, factors of narrative meaning-making for memories of stressful events, which shed light on the nuanced relations with well-being.

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Highly stressful events pose both immediate deleterious consequences and possible ongoing problems to one's future plans and overarching life story (McLean, Pasupathi, & Pals, 2007). Research on coping (Lazarus & Folkman, 1984), expressive writing (Pennebaker & Chung, 2011), and narrative identity (McAdams & McLean, 2013) converge around the idea that more meaningful narrations of stressful events decrease stress and increase well-being. Narrative analysis has been a robust tool for clinical, cognitive, and personality psychologists alike because of its flexibility capturing the multitude of meaningful forms of expression within autobiographical narratives (Bruner, 1991), and broad well-substantiated relations between forms of narrative meaning-making and psychological states (Adler, Lodi-Smith, Philippe, & Houle, 2016).

A limitation of this literature, however, is that studies that examine narrative meaning-making from cognitive, clinical, and personality perspectives employ different narrative coding manuals (i.e., schemes), and in turn relate the scores from these coding schemes to different aspects of psychological distress and/or well-being. Consequently, making comparisons across studies are difficult, and understanding mechanisms by which narrative meaning-making and psychological states are related are not well understood. An empirical investigation of the structure of narrative meaning-making is needed to better understand the complexity of narrative meaning-making, especially as it relates to links between narratives of highly stressful experiences and psychological state. Thus, the two major objectives of this research are: (1) to take a necessary preliminary empirical step towards identifying possible underlying relations among multiple narrative meaning-making indicators most frequently used in the narrative meaning-making literature and (2) to see if these emergent underlying factors relate differentially to psychological distress. We focus on narratives of highly stressful experiences, as these narratives have obvious implications for symptoms of distress (McLean et al., 2007).

Bruner (1987) first introduced the idea of narratives into the cognitive literature by positing that narrative was a basic form of thinking about the self and the world. The narrative expression of personal experience includes agents with thoughts, feelings, goals, obstacles, and outcomes. People move beyond recollecting a series of actions to retelling a storied personal experience in order to understand and create meaning (Bruner, 1991). Storying personal events is critical for identity formation and emotion regulation (Fivush, 2011; McLean et al., 2007).

Creating meaningful narratives of stressful experiences may be especially important, as these experiences challenge how people think about themselves (Park, 2010) and others in these moments (Mikulincer & Shaver, 2007). Park contends that distress increases when specific challenging moments do not align with current cognitive framework for daily life (Park, 2010). Meaning-making through narrative is one possible mechanism for such

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realignment because, theoretically, it facilitates coping and resolution of stressful experiences in beneficial ways (McAdams & McLean, 2013; Park & Blumberg, 2002). As yet, however, there is not an overarching empirical framework for understanding the multiple ways in which people create narrative meaning from negative experiences. This is, perhaps, because two prominent approaches to narrative meaning-making – the cognitive approach and the personality approach – focus on separate empirical issues within the study of narrative meaning-making that ultimately make insights in this research unincorporated and fragmented.

### Cognitive approach

Cognitive research on narrative meaning-making primarily focuses on how people structure and evaluate events (i.e., basic memory). The coherence and emotional intensity of narratives are common indicators of this narrative structure and evaluation, respectively. Studying these theoretical narrative indicators has led to insights into how various cognitive factors might be linked with narrative meaning-making, basic memory processes, and psychological functioning.

The first indicator, narrative coherence, emphasises the extent the narrative is told in a chronological, contextualised, and themed manner (Reese, Haden, Baker-Ward, Bauer, Fivush, & Ornstein, 2011). In general, negative events are narrated more coherently than positive events (Fivush, Sales, & Bohanek, 2008), but this interacts with the second indicator, emotional intensity; more highly emotional events, both positive and negative, are narrated more coherently than less emotional events, suggesting that there is greater need to organise more emotional events, as compared to less emotional events (Bohanek, Fivush, & Walker, 2005; Dolcos, LaBar, & Cabeza, 2004). Studies postulate that higher coherence reflects greater efforts to understand the experience and to resolve the negative emotions (Pennebaker & Chung, 2011). Thus, we would expect narratives with higher structure to be linked to more positive psychological states.

Indeed, higher narrative coherence is related to higher levels of positive well-being (Baerger & McAdams, 1999; Waters & Fivush, 2015) and lower levels of distress (Brewin, 2016). Moreover, over days of journaling about negative experience (i.e., expressive writing), lexical indicators of coherence (e.g., the use of specific words such as "realize", "understand") tend to increase, and these lexical increases correspond to decreases in psychological distress (see Pennebaker & Chung, 2011, for a full review). Research reveals that many cognitive factors influence greater efforts after narrative meaning-making, such as greater subjective impact of the experience (Wood & Conway, 2006), more time in one's meaning-making (Boals, Banks, Hathaway, & Schuettler, 2011), and the greater prolongation of sharing the experiences (Curci & Rimé, 2012). But, in general, the extent to which one narrates one's story in an organised and resolved manner has a positive impact on psychological states.

The second indicator, emotional intensity, emphasises the expression of emotion within narratives. Both children and adults use more negative emotional language when narrating a highly frightening event than when narrating an everyday conflict experience (Fivush et al., 2008). Yet emotional arousal appears to decrease over time; over days of expressive writing, decreased expression of negative affect and increased expression of positive affect generally relates to higher levels of well-being (Pennebaker & Chung, 2011) and working memory capacity (Klein & Boals, 2001). Thus, increases in more positive and less negative emotional language also has a positive impact on psychological states.

Importantly, coherence and emotional intensity might function simultaneously in relating to psychological distress and well-being over time. For example, increased psychological functioning might be attributed to increased coherence across therapy (Foa, Molnar, & Cashman, 1995) and/or the reduction in negative emotional intensity (see Rubin et al., 2016 for argument). There is some reason to think that both structure and emotional arousal of narrative matter in explaining psychological state, as the concurrent presence of positive emotional resolutions (Pals, 2006), or emotional closure (Boals et al., 2011), in one's coherent narrative help explain increased psychological well-being. Thus, the next empirical step is to both examine how coherence and emotional intensity interrelate in narrative meaning-making, and how they each relate to psychological distress and well-being, in order to better understand how narrative meaning-making relates to better psychological functioning.

### Personality and clinical approaches

Personality research on narrative meaning-making primarily focuses on how one creates a sense of self through personal storying. Personality literature on narrative meaning-making focuses on three broad theoretical indicators: the motivations, themes, and integrative processing expressed in narratives (see, e.g., Adler et al., 2016; McAdams & McLean, 2013). Examining these storytelling indicators has yielded insights into how various personality factors might be linked with both narrative meaning-making and positive psychological states.

Motivational aspects of narrative meaning-making are theorised to provide a window into enduring aspects of personality expressed in personal storytelling. Achievement (i.e., agency) and affiliation (i.e., communion) are considered the two basic personality orientations (McAdams, Hoffman, Day, & Mansfield, 1996). In particular, McAdams et al. (1996) observed that people higher in power motivation, as assessed by the Thematic Apperception Test, tended to narrate events more agentically (e.g., themes of mastery, victory), and those higher in intimacy motivation narrated events more communally (e.g., themes of

love and care). McAdams and colleagues later explored the interrelations between motivational aspects of narrative and personality to better understand self-identity and well-being (McAdams et al., 2006). More specifically, Adler (2012) found that narrators' agency tends to increase across therapy sessions and this increase predicts decreases in internalising clinical symptomology (e.g., anxiety, low self-esteem). Motivational themes can also be viewed through an attachment theory lens (Mikulincer & Shaver, 2007) in which individuals are more or less motivated to seek and find comfort in the support of others during times of distress (Ein-Dor, Mikulincer, & Shaver, 2011). For example, securely attached adults provide more emotionally regulated narratives (e.g., more equanimity, less emotional contradiction) about their childhood experiences (Main, 1995) and about their current relationships (Treboux, Crowell, & Waters, 2004), compared to more insecurely attached adults who recall memories in a more confused, emotionally flat manner (Crowell, Fraley, & Shaver, 1999; Main, Kaplan, & Cassidy, 1985). Thus, motivational indicators appear to impact how people narrate experience across time, and are related to psychological functioning.

Narrative identity researchers have also drawn on Erikson's (1968) theory of psychosocial development to postulate the importance of narrative themes of resolution, exploration, and integration. A narrator has developmental projects (e.g., forming an identity) across a lifespan that are imbued in one's personal stories (Conway & Holmes, 2004). For example, *resolution* coding schemes – such as redemption and contamination – measure the positive and negative conclusions one draws from one's experience as it relates to broader issues of identity and meaning in life (i.e., things can go from bad to good or from bad to worse for the self, respectively; McAdams, Reynolds, Lewis, Patten, & Bowman, 2001). Expression of contamination in stressful memories, in particular, is related to negative psychological states (Waters, Shallcross, & Fivush, 2013). Additionally, *exploratory* coding schemes capture how the narrator expresses change in personal meaning for one's self over time within the narrative. For example, the narrator who explores multiple or changing perspectives in the narrative are more likely to show higher levels of growth and well-being (Graci & Fivush, 2017; Pals, 2006). Alternatively, the ruminating narrator rigidly views the same emotional experience from the same negative viewpoint, which is related to depression and anxiety (Ehring, Frank, & Ehlers, 2008).

Finally, *integrative* coding schemes are autobiographical reasoning schemes that attempt to capture how the protagonist engages in processing what this event means specifically for self-understanding (Bruner, 1991; Fivush & Baker-Ward, 2005; Habermas & Bluck, 2000). Learning positive things about the self from negative experiences (e.g., "I am strong;" "people are there for me") has been shown to relate to a greater sense of well-being, whereas learning negative things about the self (e.g., "I cannot cope;" "I feel abandoned") relates to experiences of anxiety and distress (Merrill, Waters, & Fivush, 2016). Autobiographical reasoning appears to be especially important for negative events, in contrast to positive, because of the reflective nature negative events often impose on the self (Lilgendahl & McAdams, 2011). The multitude of ways narrators subjectively theme their personal stories with resolution, exploration, and integration are clear indicators of distress and well-being.

However, similar to the earlier argument about coherence and emotional intensity, motivations and themes may not be independent. For example, high levels of agency and communion, as well as low levels of contamination, relate to higher well-being after recovering from a physical injury (Adler et al., 2015). Consistent with this finding, Bauer and McAdams (2010) found that intellectual growth goals (e.g., to learn, explore) predicted later ego development, and especially so for agentic intellectual growth goals compared to communal growth goals. In contrast, socioemotional growth goals (e.g., develop a personal relationship) predicted later subjective, and especially so for communal compared to agentic growth goals. These findings suggest a hierarchy of narrative goals by themes and motivations in one's personal stories that predict psychological function. Yet a problem in much of this literature is that narrative variables, which often correlate quite highly with each other, are analyzed as independent predictors. Again, Bauer and McAdams (2010) is an example: in their study, correlations between intellectual growth goals and agentic intellectual growth goals was quite high ($r = .98$), as were socioemotional growth goals and communion socioemotional growth goals ($r = .81$), making it difficult to ascertain if these narrative indicators are tapping different types of meaning-making, and/or if they relate to psychological states in specific ways. A more direct empirical investigation of how these narrative schemes interrelate/interact and differentially relate to specific aspects of distress and well-being would be beneficial for advancing theory and empirical work in this area (King & Raspin, 2004; Lodi-Smith, Geise, Roberts, & Robins, 2009; Mansfield, Pasupathi, & McLean, 2015; Pals, 2006).

### *Bridging of cognitive, personality, and clinical approaches for narrative framework*

The richness of narrative expression highlights the many ways they can be analyzed, which simultaneously presents a critical analytic limitation. Cognitive lines of research tend to focus on examining how narrators structure and evaluate experiences in efforts to process and remember *events*. Personality lines of research tend to focus on how people make sense of their lives more generally through focusing on how narrators imbue their autobiographical stories with motivations and themes in an effort to process and understand the *self*. A critical limitation in the existing literature is that many studies code narratives

in different ways. Such an approach does not facilitate comparison across studies because there is no empirical way to examine whether certain narrative coding indicators relate to one another (e.g., "positive emotions," "growth" "positive self-event connections," "exploratory processing"), or are measuring the same theoretical construct. Further, because different indicators are coded across studies, it is unclear whether some narrative indicators within a narrative framework may be more important than others in predicting distress and well-being.

Only one study in the literature has attempted to examine how multiple narrative meaning-making coding schemes may be interrelated and/or differentially related to psychological states. In a qualitative review across a series of narrative identity studies, Adler et al. (2016) theorised four narrative meaning-making factors: motivational (e.g., agency and communion), affective (e.g., positive & negative affect), integrative (e.g., exploration), and structural themes (e.g., coherence), but they were unable to examine this possibility empirically. Further, they reviewed studies examining multiple types of event narratives, and did not consider how the type of event being narrated might be important. It is highly likely that how one narrates stressful and traumatic events will be particularly important for psychological states (McLean et al., 2007). To date, no study has coded multiple narrative narrative indicators on the same set of stressful event narratives, and subjected these indicators to any kind of latent empirical exploration to examine the underlying factor structure of narrative meaning-making, and how this underlying factor structure may relate to psychological distress.

### *Present study*

In this study, we empirically examined the structure of multiple narrative indicators coded from highly stressful experiences, and evaluated whether the emergent structure was related to multiple aspects of psychological distress. In order to examine these questions, we relied upon an existing dataset of individuals narrating a highly stressful experience. We coded each narrative using 15 narrative schemes, which we selected because they are used frequently in the cognitive and personality literatures, and reflect multiple theoretically important indicators of narrative meaning-making, including structure, valence and affective content, themes, and motivations.

First, we employed exploratory structural equation modeling (ESEM) techniques to ascertain the structure and adequacy of the organisation of the theoretical narrative indicators. Second, we examined the emergent factor structures' relations with multiple indices of distress, including post-traumatic stress, depression, and anxiety. We were also able to examine greater well-being though measures of growth and social support. We acknowledge that these are not standard measures of well-being in the literature, but because we worked with an archived data set, and wanted at least some preliminary measure of more positive aspects of psychological states, we included these measures. Thus, we were able to ascertain whether narrative factors related differentially to various indices of well-being. Finally, because there is some evidence that both narrative indicators and well-being are related more broadly to aspects of personality, especially traits and dispositions (Baddeley & Singer, 2008; McAdams et al., 2004), we included statistical controls for the big five personality traits to examine the extent to which narrative factors relate to psychological states above and beyond personality. Because this is the first study in the literature to assess these questions in this manner, we viewed it as exploratory and advanced no specific predictions.

## Method

### *Participants and procedure*

Data were drawn from a larger existing dataset examining how people remember highly emotional experiences and its relations to individual differences, including psychological well-being. In total, 224 undergraduates completed the study ($M_{age} = 19.2$ years, $SD_{age} = 2.1$, 114 males and 110 females); 67.6% were self-identified as Caucasian, 12.0% as East Asian, 7.6% as African-American, 4.0% as South Asian, 2.2% as Hispanic, and 6.7% as mixed or Other origin. Participants received course credit for participation, and all procedures were approved by the university's Institutional Review Board. Participants sat in a university classroom with six to eleven other participants, were spaced several seats apart, and completed a workbook that contained four writing prompts (only one of which prompted for the most traumatic, or stressful, time in life) and a battery of personality and well-being questionnaires (see Waters, Bohanek, Marin, & Fivush, 2013, for more details).

Because we had measures of post-traumatic stress and post-traumatic growth only for the stressful event narrated, only that narrative was analyzed here. Assessment of post-traumatic stress and post-traumatic growth (described below) took place immediately after completing the narrative; participants were asked to report post-traumatic stress and growth specific to that event.

The remaining well-being and personality trait measures were embedded in a series of questionnaires presented in a standardised random order between the writing prompts. Participants had unlimited time to complete the workbook and took 90–120 min on average.

The narrative writing prompt was adopted from the expressive writing literature (Pennebaker, 1997):

> I would like for you to write about your most traumatic experience of your life. This should be an extremely emotional event that has affected you and your life. You may include the facts of the event, as well as your deepest thoughts and feelings. All of your writing will be kept confidential. Do not worry about spelling, sentence structure, or grammar. There is no time limit on your writing; you may write about this event for as long as needed.

### Narrative coding

All narratives were transcribed verbatim from the handwritten transcripts into word files, and checked for accuracy of transcription and adherence to instructions. All participants narrated a specific traumatic experience. As described earlier, the present study examined 15 narrative coding schemes in total, which were selected based on both theoretical arguments in the cognitive, personality, and clinical literature and Adler et al. (2016) recommendations as a general guide to possible factors. Accordingly, all coding schemes used in this study are based entirely on past theory and research. As discussed in the introduction, *motivational* themes were captured by the following coding schemes: agency and communion (Grysman, Fivush, Merrill, & Graci, 2016; McAdams et al., 1996), as well as support seeking (Graci & Fivush, 2017). *Affective* themes were captured by the following coding schemes: positive affect and negative affect (Grysman et al., 2016), rumination (Nolen-Hoeksema, 2000), and contamination (McAdams et al., 2001). We note that we tried to code these narratives for redemption as well, but too few of the narratives expressed this theme at all. *Integrative meaning* themes were captured by the following coding schemes: exploration (Graci & Fivush, 2017; Pals, 2006), interpretive elaboration which captured thoughts and evaluations of the event (Grysman et al., 2016; Pasupathi & Wainryb, 2010), and positive self-event connections and negative self-event connections (Merrill et al., 2016; Pasupathi, Mansour, & Brubaker, 2007), which capture autobiographical reasoning. *Structural* themes were captured by the following coding schemes: factual elaboration that captures complex detail (Grysman et al., 2016; Pasupathi & Wainryb, 2010), and the three subscales of coherence: context, chronology, and theme (Pasupathi & Wainryb, 2010; Reese et al., 2011). Brief descriptions, scoring ranges, and reliability of each coding scheme can be found in Table 1. All theoretical narrative indicators were treated as dimensional as opposed to ordinal or dichotomous in light of the limitations of the latter approaches (e.g., Cohen, 1983).

Each theoretical narrative indicator was coded by two independent coders. Whereas the two specific coders were different for each narrative indicator, the training and reliability procedure was the same. For each indicator, two coders learned the specific coding scheme through reading and discussion of that coding manual. Then the two coders used a predetermined set of the narratives during the coding training phase. During this phase, the two coders discussed each narrative code in depth. After training, a previously unexamined subset of narratives (approximately 15%–20% of dataset) was coded independently by each coder in order to compute reliability. Once reliability was established, one coder scored the rest of the dataset, including re-coding the narratives used during the training phase. An additional subset of narratives was independently coded by both coders towards the end of coding each scheme to check for coding drift, and this was included in the reliability estimate. As you

**Table 1.** Narrative coding schemes.

| Coding scheme | Brief description | Range | Mean | SD | Reliability |
|---|---|---|---|---|---|
| Motivational themes | | | | | |
| Agency | Expression of self-mastery, empowerment, achievement, and/or status. | 0–3 | .83 | 1.13 | ICC = .96 |
| Communion | Expression of active efforts to achieve personally meaningful goals concerning positive self or relationship development. | 0–3 | 2.06 | .90 | ICC = .87 |
| Support seeking | Hypervigilance to threat with no evidence others can help on the lower end. Expression of the utilising of meaningful others in an emotionally regulated manner on the higher end. | 0–3 | 1.57 | 1.27 | ICC = .83 |
| Affective themes | | | | | |
| Positive affect | Positive emotion words or expressions of affect. | 0–8 | 1.08 | 1.48 | $\kappa$ = .80 |
| Negative affect | Negative emotion words or expression of negative affect. | 0–24 | 7.41 | 5.17 | $\kappa$ = .80 |
| Rumination | Level of expression of repetitive self-focused thinking about one's negative feelings and conditions. | 0–3 | 1.12 | 1.07 | ICC = .95 |
| Contamination | The extent to which a demonstrably positive event leads to emotionally negative outcomes, or a negative event spirals down into a more intense or damaging negative event. | 0–5 | 1.07 | 1.37 | ICC = .91 |
| Integrative themes | | | | | |
| Exploration | The degree to which one makes an active effort to explore, reflect on, or process a difficult life experience in an open manner. | 0–3 | 1.74 | 1.26 | ICC = .94 |
| Interpretive elaboration | Expression of subjective details of the context, including: thoughts, emotions, beliefs, and reasoning about the event. | 0–3 | .91 | .92 | ICC = .85 |
| Positive self-event connections | The frequency of explicit positive connections the individual constructs between their experience and sense of self., including dispositions, values, outlooks, personal growth, and/or intimacy. | 0–9 | 1.18 | 1.58 | $\kappa$ = .84 |
| Negative self-event connections | The frequency of explicit negative connections the individual constructs between their experience and sense of self, including dispositions, values, outlooks, personal growth, and/or intimacy. | 0–7 | .98 | 1.55 | $\kappa$ = .84 |
| Structural themes | | | | | |
| Context | Both time and place are mentioned and both are specific. | 0–3 | 2.17 | .95 | ICC = .88 |
| Chronology | Naïve listener can order almost all (> 75%) of the temporally relevant actions. | 0–3 | 2.41 | .76 | ICC = .94 |
| Theme | Narrative includes all the above and a resolution to the story, or links to other autobiographical experiences including future occurrences, or self-concept or identity. | 0–3 | 2.30 | .67 | ICC = .90 |
| Factual elaboration | Expression of objective details of the context, including: who, what, when, where, and how actions physically unfolded. | 0–3 | .96 | .93 | ICC = .91 |

can see on Table 1, which reports all coding reliability statistics, all reliability statistics were strong. Intraclass correlations (ICCs) were used to report most reliability statistics since they were dimensional, and Cohen's kappa ($\kappa$) was used for all frequency based coding schemes, such as positive and negative affect, given that they were categorical in nature.

### Psychological distress and well-being

We relied upon three measures of distress. Event distress was assessed using *The Impact of Event Scale-Revised* (Weiss & Marmar, 1997), which comprises 22-items rated on a 5-point scale (0 = *not at all* and 4 = *extremely*) that load onto three subscales: instrusion (8 items), avoidance (8 items), and hyperarousal (6 items). Within-subscale items were averaged (range = 0–4) and then summed the total score (range = 0–12).

Depression was assessed using the *Beck Depression Inventory –II* (Beck, Steer, & Brown, 1996), a 21-item questionnaire designed to assess depression symptoms; each item is on a 4 point scale (0–3). All items were summed for global score.

Anxiety was assessed using the 40-item *State-Trait Anxiety Inventory for Adults* (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). For this study, we used 20 items corresponding to trait anxiety on a 4-point scale (0 = *almost never* and 4 = *almost always*). All items were summed for global score. We note that, due to the questions addressed in the original data collection, we collected trait anxiety. We return to this limitation in the discussion.

In addition, we used two measures of positive well-being. Perceived Social Support was assessed using the 36-item *Multidimensional Scale of Perceived Social Support* (Zimet, Dahlem, Zimet, & Farley, 1988 ), which is designed to capture social support across three dimensions: friends, family, and romantic partners. Items were measured on a 7-point scale (1 = *very strongly disagree* and 7 = *very strongly agree*). All items were summed for global score.

Stress-related growth was assessed using the 21-item *Post-traumatic Growth Inventory* (Tedeschi & Calhoun, 1996) which measures positive outcomes on five subscales and assesses the extent of positive change following a distressing event (e.g., "new opportunities are available which wouldn't have been otherwise," "appreciating each day," "a sense of closeness with others") on a 6-point scale for each item (1 = *to a very small degree* and 6 = *to a very great degree*). All items were summed for global score.

### Personality traits

Personality traits were assessed using the *NEO Five Factor Inventory;* Costa & McCrae, 1992), a widely-used and well-validated general personality measure, which consists of 60 items discerning stable dispositions along five dimensions: Extraversion, Neuroticism, Agreeableness, Conscientiousness, and Openness to Experience. Each item was assessed on a 5-point scale (1 = *strongly disagree* and 5 = *strongly agree*) and within-dimension items were summed.

### Data analytic plan

We used ESEM in a purely exploratory manner to explore the factor structure of our narrative themes. We conducted all factor analyses using Mplus version 7.2 (Muthén & Muthén, 2014). Data were analyzed using the MLR estimator (maximum likelihood estimator with robust standard errors) to account for any non-normality among our variables and fit to the raw data via full-information maximum likelihood, which allows for missing data and yields less biased parameter estimates than listwise or pairwise deletion. We focused on first-order oblique as opposed to orthogonal models. As is most common in the literature, we used an oblique geomin rotation with an epsilon value of .5 to allow maximum flexibility in the exploration of factor structure; this rotation performs well under circumstances in which cross loadings are expected (Asparouhov & Muthén, 2009; Marsh, Morin, Parker, & Kaur, 2014), which is consistent with existing literature positing that narrative factors are separable but overlapping entities (Adler et al., 2016). ESEM models were estimated with all rotated factor loadings freely estimated, and with the minimum constraints on the unrotated factor solution required for model identification. Factor scores were extracted using a maximum likelihood a posteriori (i.e., regression) method (Asparouhov & Muthén, 2009).

### Goodness-of-fit

To evaluate model fit, we reported the following goodness-of-fit statistics: the chi-squared ($\chi^2$) test statistic and its associated degrees-of-freedom (df), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardised root mean square residual (RMSR).

We relied upon the use of the RMSEA.LB (i.e., RMSEA lower bound) index to determine the optimal number of ESEM factors, which is advantageous when ESEMs are primarily exploratory in nature (Preacher, Zhang, Kim, & Mels, 2013). Further assessment of model fit was based on guidelines suggested in the literature, including: TLI greater than 0.95 for reasonably good fit (Hu & Bentler, 1999) and values between 0.90 and 0.95 for acceptable model fit (Bentler, 1990); RMSEA less than or equal to .08 and .05 for adequate and close fit, respectively (MacCallum, Browne, & Sugawara, 1996); and RMSR values less than or equal to .10 and .05 for adequate and close fits, respetively (Cole, 1987). Although the $X^2$ values and their associated degrees of freedom and $p$ values are presented for each model tested because they were used to calculate other fit indices, they were not used to assess model fit given that a model would almost certainly be rejected under this test given our sample size (Brown, 2006).

### *Incremental validity*

Using the best-fitting ESEM model, we first examined zero-order correlations between the narrative factors by estimating their associations with five-factor model personality traits, and five indices of psychological well-being. Next, we examined the narrative themes factors' incremental contribution above and beyond personality traits in predicting psychological well-being (see Adler et al., 2016, for a review). To do so, we conducted hierarchical regression analyses in which five-factor model personality traits were entered in the first step and the narrative indicators' factor scores in the second.

## Results

The majority of the narrated memories concerned a death or loss (36%), followed by serious illness or injury (22%), interpersonal conflicts (21%), shame (6%), legal trouble or serious punishment (4%), sexual abuse or neglect or assault (4%), relocating (4%), or natural disasters or terrorism (2%). The average narrative was approximately 259 words long, or roughly a full page of a document.

### *Objective 1: exploring the underlying structure of narrative indicators*

ESEMs allowing for one through ten oblique factors revealed that a four-factor model fit best ($\chi^2$ (51) = 82.99, $p = 0.003$; BIC = 10107; RMSEA = 0.05, $p = 0.39$; CFI = 0.97; TLI = 0.93; SRMR = 0.03). Factor 1 was defined by medium loadings (presented in decreasing order of factor loading) from support seeking, (reversed) contamination, positive affect, (reversed) negative self-events connections, and positive self-events connections, with a small but significant loading from factual elaboration. This factor appears to reflect *positive processing* because these narrative indicators assess both the positive valence and meaning-making expressed from the experience. Factor 2 was defined by high loadings from negative affect, rumination, interpretive elaboration, and (reversed) support-seeking, with significant and small to medium loadings from contamination, negative self-events connections, and agency. This factor appears to reflect *negative processing* because these narrative indicators assess both the negative valence and meaning making expressed from the experience. Factor 3 was defined by significant and high loadings from exploration, positive self-event connections, and theme, with significant and small to medium loadings from positive affect, rumination, negative self-events connections, communion, (reversed) factual elaboration, and interpretive elaboration. This factor appears to reflect *integrative meaning* because these narrative indicators assess how one elaborates and reflects on one's subjective perspective over time. Factor 4 was defined by significant and high loadings from chronology, context, factual elaboration, and theme, with significant and small loadings from contamination, support-seeking, and negative affect. This factor appears to reflect *structure* because these narrative indicators assess how one organises and frames one's experience. See Table 2 for all ESEM factor loadings and intercorrelations.

**Table 2.** ESEM factor loadings and intercorrelations.

| Narrative indicators | Factor 1 | Factor 2 | Factor 3 | Factor 4 |
|---|---|---|---|---|
| Agency | .23 | .22* | −.05 | .18 |
| Communion | .21 | −.09 | .31** | .13 |
| Support seeking | .43* | −.51*** | .07 | .20** |
| Contamination | −.40** | .31* | −.18 | .21** |
| Positive affect | .39*** | .09 | .34** | .11 |
| Negative affect | .12 | .70*** | .19 | .19*** |
| Rumination | −.27* | .65*** | .33*** | −.06 |
| Exploration | −.11 | −.12 | .88*** | .07 |
| Interpretive elaboration | .08 | .53*** | .23*** | .02 |
| Negative self-connections | −.37*** | .27* | .33*** | .08 |
| Positive self-connections | .37*** | .08 | .68*** | −.06 |
| Theme | −.20 | −.07 | .47*** | .52*** |
| Context | .07 | .07 | −.14 | .60*** |
| Chronology | .03 | .01 | −.06 | .76*** |
| Factual Elaboration | .22* | .12 | −.26*** | .58*** |
| Factor intercorrelations | | | | |
| Factor 1 | | | | |
| Factor 2 | −.20*** | | | |
| Factor 3 | .08 | .23 | | |
| Factor 4 | .12 | .16 | .17 | |

Note: Statistical significance is denoted as follows: *$p < .05$; **$p < .01$; ***$p < .001$.

### *Objective 2: incremental validity of narrative themes*

#### *Zero-order correlations*

As expected, personality traits were consistently related to the many well-being indices (Table 3), although there were fewer relations between traits and narrative factors (Table 4, see also Table 5 for descriptive statistics on the well-being indices). Neuroticism was negatively related to negative processing and agreeableness was positively related to integrative meaning. The sparse relations suggest that narrative indicators may reflect a different level of analysis than personality traits and therefore might provide additional variance to well-being. To evaluate the incremental validity of narratives above and beyond general personality traits in predicting psychological well-being, we conducted a series of hierarchical regressions in which all Big 5 domains were entered as the first step and narrative themes in the second step (see Table 6).

#### *Incremental validity above and beyond personality*

*Event distress*. Personality traits and narrative factors explained 27.5% of the variance in event distress. Narrative factors were significant predictors of event distress above and beyond personality traits: $\Delta R^2 = .14$, $\Delta F(4, 191) = 9.31$, $p < .001$. Neuroticism ($\beta = .30$, $t = 4.37$, $p < .001$), Narrative Factor 2 (i.e., *Negative Processing*; $\beta = .24$, $t = 3.33$, $p = .001$), and Narrative Factor 4 (i.e., *Structure*; $\beta = .20$, $t = 3.09$, $p = .002$) were significant positive predictors of event distress.

**Table 3.** Correlations between traits and psychological states.

| | Event distress | Depression | Anxiety | Perceived social support | Stress-related growth |
|---|---|---|---|---|---|
| Neuroticism | .32*** | .69*** | .80*** | −.22** | −.00 |
| Extraversion | .01 | −.35*** | −.40*** | .23** | .18* |
| Openness | .18* | .13 | .10 | −.01 | .12 |
| Agreeableness | −.05 | −.18* | −.17* | .29*** | .12 |
| Conscientiousness | −.11 | −.31*** | −.30*** | .22** | .06 |

Note: Statistical significance is denoted as follows: *$p < .05$; **$p < .01$; ***$p < .001$.

**Table 4.** Correlations between narrative factors, traits, and psychological states.

| | Positive processing | Negative processing | Integrative meaning | Structure |
|---|---|---|---|---|
| Neuroticism | −.18** | .12 | −.01 | −.02 |
| Extraversion | .05 | .03 | .00 | .07 |
| Openness | .04 | .12 | .10 | .12 |
| Agreeableness | .08 | .09 | .22** | .10 |
| Conscientiousness | .09 | .09 | .12 | .09 |
| Event distress | −.20** | .35*** | .13 | .22** |
| Depression | −.14* | .07 | −.06 | .00 |
| Anxiety | −.23** | .12 | −.04 | .01 |
| Perceived social support | .17* | −.07 | .12 | .13 |
| Stress-related growth | .09 | .03 | .27*** | .11 |

Note: Statistical significance is denoted as follows: *$p < .05$; **$p < .01$; ***$p < .001$.

*Depression*. Personality traits and narrative factors explained 53.0% of the variance in depressive symptomology. Nevertheless, the narrative factors were not significant predictors of depressive symptomology after taking into account personality traits: $\Delta R^2 = .01$, $\Delta F(4, 197) = 0.65$, $p = .63$. Neuroticism ($\beta = .61$, $t = 11.50$, $p < .001$), Extraversion ($\beta = -.14$, $t = -2.41$ $p = .02$), and Openness ($\beta = .13$, $t = 2.58$, $p = .01$) were significant predictors of depression.

*Anxiety*. Personality traits and narrative factors explained 67.7% of the variance in trait anxiety. Narrative factors all together did not predict trait anxiety above and beyond personality traits, although their incremental contribution trended towards significance: $\Delta R^2 = .01$, $\Delta F(4, 200) = 2.17$, $p = .07$. Neuroticism ($\beta = .70$, $t = 16.04$, $p < .001$), Extraversion ($\beta = -.16$, $t = -3.41$, $p = .001$), Conscientiousness ($\beta = -.09$, $t = -2.12$, $p = .04$), Narrative Factor 1 (i.e., *Positive Processing*; $\beta = -.10$, $t = -2.32$, $p = .01$), and Narrative Factor 4 (i.e., *Structure*; $\beta = .09$, $t = 2.04$, $p = .04$) were significant predictors of anxiety.

*Perceived Social Support*. Personality traits and narrative factors explained 15.8% of the variance in perceived social support, but narrative factors did not predict significantly above and beyond personality traits: $\Delta R^2 = .03$, $\Delta F(4, 203) = 1.58$, $p = .18$. Agreeableness ($\beta = .20$, $t = 2.61$, $p = .01$) was the only significant predictor of perceived social support.

*Posttraumatic growth*. Personality traits and narrative factors explained 12.3% of the variance in posttraumatic growth. Narrative factors explained a significant amount of the variance in posttraumatic growth above and beyond personality traits, $\Delta R^2 = .08$, $\Delta F(4, 191) = 4.41$, $p = .002$. Extraversion ($\beta = .18$, $t = 2.33$, $p = .02$), Narrative Factor 3 (i.e., *Integrative meaning;* $\beta = .27$, $t = 3.68$, $p < .001$) were significant predictors of posttraumatic growth.

Of note, when we examined personality traits' incremental contribution in predicting psychological state above and beyond the narrative factors, we obtained nearly identical results, with the exception that traits did not predict growth above and beyond the narrative factors. We also separately controlled for word count, rating of the subjective impact of the event, and rating of the frequency of thinking or talking about the event, and we obtained virtually identitical results each time.[1] These

**Table 5.** Psychological states descriptives.

| | Mean | SD | Range |
|---|---|---|---|
| Event distress | 5.48 | 2.31 | .25–11.63 |
| Depression | 10.50 | 8.87 | .00–49.00 |
| Trait anxiety | 40.81 | 11.56 | 19.00–71.00 |
| Perceived social support | 66.62 | 13.60 | 12.00–84.00 |
| Stress-related growth | 68.51 | 21.46 | 21.00–122.00 |

**Table 6.** ESEM factors' relations with psychological states.

| | Psychological states | | | | |
|---|---|---|---|---|---|
| Predictor | PTSD | Depression | Anxiety | Perceived social support | Growth |
| Neuroticism | .30*** | .61*** | .70*** | −.12 | .06 |
| Extraversion | .14 | -.14* | −.16** | .08 | .18* |
| Openness | .11 | .13* | .08 | −.02 | .08 |
| Agreeableness | −.09 | .00 | .02 | .20* | −.01 |
| Conscientiousness | −.10 | −.10 | −.09* | .09 | .00 |
| Block 1 $\Delta R^2$ | .13 | .52 | .66 | .13 | .05 |
| Factor 1 (Pos Pro) | −.12 | −.04 | −.10* | .09 | .05 |
| Factor 2 (Neg Pro) | .24** | −.03 | −.02 | −.09 | −.06 |
| Factor 3 (Integrat) | .05 | −.05 | −.02 | .06 | .27*** |
| Factor 4 (Struct) | .20** | .05 | .09* | .06 | .06 |
| Block 2 $\Delta R^2$ | .14 | .01 | .01 | .03 | .08 |
| Total $R^2$ | .28 | .53 | .68 | .16 | .12 |

Note: Block 2 standardised beta's are displayed for all predictor variables. *$p < .05$; **$p < .01$; ***$p < .001$.

results suggest that the shared variance between narrative factors and personality traits best predicted well-being criteria in most cases. Altogether, although some aspects of well-being were not predicted by narrative factors, each narrative factor did play a role in predicting some aspects of well-being over and above traits. In particular, *Positive Processing* (Factor 1) significantly predicted lower anxiety; *Negative Processing* (Factor 2) significantly predicted higher event distress; *Integrative Meaning* (Factor 3) predicted higher growth; and *Structure* (Factor 4) significantly predicted higher event distress and anxiety.

## Discussion

To our knowledge, this is the first study in the literature to empirically examine the underlying structure of 15 theoretical narrative indicators of meaning-making for stressful events. Whereas research has established the beneficial effects of narrating stressful events, the actual mechanism underlying this benefit is not well understood (Pennebaker & Chung, 2011). Thus, for both theoretical and applied reasons, it is critical that research begins to examine in more depth the specific underlying narrative factors that do (and do not) relate to psychological states when narrating stressful and traumatic experiences. A primary reason for this lack of clarity is the use of different coding schemes across studies that are not emprically scrutinised against a narrative framework. As such, it is difficult to compare the various beneficial ways to narrate stressful experiences across studies to draw broader conclusions. In this study, we addressed this issue. Our results are an important yet preliminary first step in examining the underlying structure of narrative meaning-making for stressful events.

We demonstrated a theoretically interpretable four-factor structure of narrative indicators and, critically, each of these factors related differentially to various aspects of psychological distress and well-being in meaningful ways. Thus, it is not simply that narrative meaning-making for stressful events is related to psychological functioning in general, but that broad forms of narrative meaning-making relate to specific psychological states. Moreover, we note that, consistent with the literature (Baddeley & Singer, 2008; McAdams et al., 2004), there were many direct relations between personality traits and various psychological functioning measures. But, critically, our four narrative indicators provided unique information in predicting distress and well-being when considering personality traits. Thus, our results confirm the importance of narrative in the process of psychological regulation. Overall, two of the factors, *structure* and *integrative meaning*, were largely consistent with the theoretical framework proposed for narrative identity by Adler et al. (2016). The two other factors that we empirically identified appear to reflect *positive* and *negative processing*.

The *positive* and *negative processing* factors appear to capture the valence and emotional intensity of the experience for the narrators – in line with cognitive research approaches to understanding event differences – but also include many personality-based narrative indicators of person level differences. More specifically, the *positive processing factor* comprised increased support seeking, positive affect, positive self-event connections, and decreased contamination and negative self-event connections. *Positive processing* was specifically related to lower anxiety. Many studies that have examined different aspects of positive processing have shown relations to higher hedonic well-being (Adler, 2012; Lilgendahl & McAdams, 2011; Lodi-Smith et al., 2009) and lower clinical symptomology (Greenhoot, Sun, Bunnell, & Lindboe, 2013). Our results confirm and extend these findings in showing both a general factor of positive processing, and specific relations to one aspect of well-being, namely lower anxiety. In contrast, the *negative processing factor* comprised increased negative affect, rumination, interpretive elaboration, support seeking, and contamination, and decreased support seeking. The *negative processing factor* related to higher event distress, which is again consistent with general findings in the literature (McAdams et al., 2001; Waters, Shallcross, & Fivush, 2013), but informs greater specificity of relations.

Interestingly, *negative processing* seems to be related to distress specific to the event being narrated, yet positive processing may be related to more generalised psychological distress. Whereas cognitive approaches to narrative emphasise differences between positive and negative event processing, personality approaches to narrative often combine positive and negative affective processing into a single narrative indicator (Lodi-Smith et al., 2009). Our results indicate that positive and negative affective processing may reflect different underlying factors of narrative meaning-making, and second, these differences in the valence of affective processing may differentially relate to distress. Here, we assessed trait anxiety; future research should extend these findings to state anxiety measures as well. More analyses scrutized against an increasingly empirically informed narrative framework can further uncover the specific relations between narrative factors and distress.

Distinct from negative and positive processing, the *integrative meaning factor* was comprised of increased exploration, positive self-event connections, thematic coherence, positive affect, negative self-event connections, rumination, and communion. Thus, this factor reflects the extent one evaluates the event in relation to the self in some way and/or connects the experience to the self, consequently providing narrative integration between the event and the self and/or explicitly narrating autobiographical reasoning and/or values. The *integrative meaning factor* specifically related to higher growth following the distressing event. In line with theorising about growth from traumatic experiences, our findings support the notion that integrative meaning is emotionally complex, encompassing aspects of both positive and negative emotional integration (Tedeschi & Calhoun, 1996). In the

process of creating meaning from highly stressful events, individuals may engage in some forms of rumination and negative self-connections, while simultaneously making more positive connection to self, exploring, and connecting to others.

Uncovering the integrative factor points both to the complexity of narrative meaning-making and the need to understand how multiple aspects or forms of narrative meaning-making may be used in combination in resolving and regulating stressful experiences. Simple unidimensional aspects of coding narratives may not capture this full complexity. Importantly, this was the only narrative factor that related to post-traumatic growth, an outcome measure that involves an integration of acceptance of the negative as a springboard for more positive outcomes of learning about the self, others, and the world – again consistent with findings in the literature (Pals, 2006). Such a finding is consistent with Bauer and McAdams (2010) who found that integrative growth goals related to ego development, a more eudemonic measure like growth, but not with well-being measures such as satisfaction with life, a more hedonic measure (see Ryan & Deci, 2001 for review of psychological health measures).

For the *structural factor*, increased theme, contextual and chronological coherence, and factual elaboration tap an underlying narrative factor theoretically measuring the extent the narrative was told in an organised, ordered, and detailed manner. These indicators are nearly perfectly in line with the theoretical expectation for an underlying structural narrative factor. The few studies that have looked at relations between structural themes, namely coherence, and well-being have positive effect sizes (Baerger & McAdams, 1999; Waters & Fivush, 2015). We found contrary evidence, in that higher structure related to higher distress levels. We emphasise that, given the importance of meaning-making for stressful and traumatic experiences in relation to well-being, we focused on meaning-making for a highly stressful event. Recall that higher structural narrative meaning-making might be in indicator of cognitive engagement in resolving the stressful experience. Cognitive engagement via narrative discourse is best studied over time, as it is a dynamic unfolding process and appears to have differential relations to well-being over time (Boals et al., 2011; Fivush, Booker, & Graci, 2017). More specifically, efforts after making meaning is a conflict-engendering process and such meaning-making is initially related to stress (Boals, Steward, & Schuettler, 2010; Helgeson, Reynolds, & Tomich, 2006) until a resolution for the experience has been achieved. Our findings further suggest that emotional processing is likely involved in structural narrative processing, and may help explain distress levels. Yet in our study, we were unable to determine where participants might be in this meaning-process because we only have one time point.

This explanation raises several limitations to our study. First, of course, is that it is a single time point, and relations between narrative meaning-making and psychological distress and well-being are assumed to dynamically emerge over time (Fivush et al., 2017). Further, the exact factor solution extracted is contingent on the actual coding schemes used in the factor analysis. We selected coding schemes that were both theoretically motivated and frequently used in the field, but, of course, the exact solution might look different with different variables in the analysis. Moreover, the specific distress and well-being measures used will have implications for empirical relations and solutions. Measuring eudemonic well-being, in particular, will be critical to examine in future research. And, of course, although our sample size was adequate, a larger sample size would improve the robustness of the underlying narrative factor solution. Finally, we examined only one type of event, a highly stressful experience. Many types of events call for meaning-making, and the structure uncovered here may or may not generalise to different types of events, and may or may not relate to distress and well-being in similar ways. To a large extent, we have very little empirical data on whether individuals are consistent in their narrative style across different types of events. There is some suggestion that coherence shows individual consistency across positive and negative event narratives (Waters, Kober, Raby, Habermas & Fivush, submitted) and across self-defining narratives and narratives about a transgression (McLean, Pasupathi, Greenhoot, & Fivush, 2017). However, whether we would see similar kinds of underlying factor structures underlying different types of events, and if so, whether these factors would be related to well-being in similar ways, is a large and unanswered question in the narrative identity literature. Narrative consistency, or lack thereof, needs to be further studied both within and across events types. A related question is the extent to which a consistent narrative style may be related to broader linguistic abilities, although there is some suggestion in the literature that narrative coherence, at least, is not related to linguistic skills (Reese et al., 2011; Waters & Fivush, 2015). Our finding that there is a theoretically meaningful narrative structure that is meaningfully related to well-being for highly stressful and traumatic experiences is an initial first step in this larger question.

Still, there are several conclusions to be drawn from our results. First, no single coding scheme can capture the entire meaning-making process. Researchers will likely benefit from assessing meaning-making with multiple narrative indicators. Moreover, our analyses indicate that these factors are intercorrelated. Although researchers might code for a specific narrative indicator, they might be assessing more than one factor. Each narrative indicator may tap multiple factors of narrative meaning-making, and the narrative indicators of narrative meaning-making, themselves, appear to be related. Such a coding scheme feature might not necessarily be a bad thing, but should be kept in mind in regards to making finer-grained inferences about relations between forms of narrative meaning-making and well-being. This point is especially important if one is

trying to better understand a specific psychological state when the narrative indicator itself falls along several underlying factors that predict differential psychological states. Further, although caution certainly needs to be paid to the exact solution extracted in this study, these initial findings suggest that theoretical models might need to consider how valence of processing plays a critical role in weaving together what might be considered disparate aspects of narrative meaning-making. This is an important step to start to better understand relations between different forms of narrative meaning-making for stressful memories, and can be examined within a larger framework for narrative identity in order to better study narrative meaning-making as a whole.

Future research should examine a wider variety of narratives, using an even wider variety of narrative indicators and well-being measures, on an even larger sample. This will likely be best accomplished through data sharing, coding, and analyses among multiple labs. Our preliminary findings support the advantages of examining narratives and well-being in these ways. Careful work pivoting between theory and empirical investigation will allow us to discover the most meaningful narrative factor solution. The many ways to assess narrative meaning-making is a strength of narrative. Yet more attention needs to be made to the underlying narrative indicators being assessed in order to make more informed inferences across the cognitive, personality, and clinical sub-disciplines. This study is an important step given the vast implementation of narrative interventions to improve well-being following stressful life experiences (see, e.g., Baikie & Wilhelm, 2005). A more complete understanding of relations between forms of narrative meaning-making and different psychological states will provide an empirical base for designing more effective interventions.

## Note

1. There were no dramatic changes noticeable with the inclusion covariates. They minor changes were as follows: The structural factor went from $\beta = .088$, $p = .043$ to $\beta = .082$, $p = .068$ with the subjective impact rating in the model to predict anxiety, and $\beta = .081$, $p = .066$ with frequency of thinking or talking about the event in the model to predict anxiety. Given the minimal change in effect size, we interpret these findings in the same manner.

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