Memories of Positive and Negative Emotional Events

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SUMMARY

Women’s memories of emotional events differing by both valence and intensity were examined for differences in narrative content and structure, as well as subjective memory ratings. Emotional valence was related to the content of the women’s narratives, and emotional intensity was related to the subjective ratings of the memories. Negative narratives contained more negative emotion, cognitive processing words, and passive sentences than positive narratives, and positive narratives contained more positive emotion words and were more complex than negative narratives. Intensely negative narratives were the longest and the least complex, and intensely positive narratives were the most coherent. Women rated both intensely negative and intensely positive events, in general, as more frequently talked/thought about, significant, unique, emotional, and vivid than moderately emotional events, and negative events were rated as more emotional than positive narratives. There was little relation between the objective content of the narratives and the women’s subjective ratings of their memory experiences. Finally, researcher-defined traumatic events did not differ from other intensely negative events. The results of this study have important implications for narrative research in general, methodological issues such as the validity of text analysis programs and subjective memory ratings, and the quality of traumatic memories. Copyright © 2004 John Wiley & Sons, Ltd.

Most research on memory for stressful events has focused on the issue of accuracy (e.g. Burke, Heuer, & Reisberg, 1992; Christianson, 1989; Yuille & Cutshall, 1986). However, there is a growing body of research examining how and what people remember about past emotional events by examining personal narratives. Narrative research takes as its starting point that individuals create meaning through narrative (Bruner, 1987), and that the emotional tone of the experience may play a critical role in the ability to create meaning, and therefore narrative (Pennebaker, 1990). Thus the major objective of this research is to examine narratives that vary by both valence and intensity of experienced emotion. A second objective is to examine relations between narrative variables and individuals’ subjective ratings of their memory.

Although there is not a clear definition of ‘personal narrative’ in the literature, it is widely accepted that personal narratives place events in the larger context of one’s life, they relate events in a meaningful order, and, most importantly, they provide evaluations of events that express their importance and personal significance (Fivush & Haden, 1997; Labov & Waletzky, 1967; McAdams, 1992). Obviously, any given narrative will vary in the extent to which it accomplishes these goals. Individuals’ ability to provide a coherent

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and emotionally integrated account of a past experience may be related to how individuals cope with stressful and emotionally negative experiences. Creating a more coherent and emotionally integrated narrative of what happened may allow the individual to create meaning and gain control over the experience.

For example, Foa, Molnar, and Cashman (1995) examined the narratives of survivors of sexual assault over time and found that narrative length increased, and the percentage of the narrative devoted to actions and dialogue decreased while the percentage of thoughts and feelings increased. The researchers also found that an increase in organized thought was correlated with a decrease in depressive symptoms. Thus the process of creating a more coherent narrative was related to better psychological well-being (see also Alvarez-Conrad, Zoellner, & Foa, 2001). In line with this interpretation, Pennebaker and his associates (Francis & Pennebaker, 1992; Pennebaker & Beall, 1986; see Pennebaker, 1997 for a review) have demonstrated that narratives that contain words reflecting positive and negative emotion, and cognitive processing of the event (words such as ‘because’, ‘realize’) are associated with better physical health and reductions in anxiety and depression. Changes in the use of emotion words and cognitive processing words may help create narrative coherence that allows the individual to fit the narrative of the stressful experience into the rest of their life story, thus enabling better coping (Pennebaker, 1990).

A few researchers have begun to examine whether content and coherence differ in narratives of positive and negative experiences. Many of these studies ask participants to rate their subjective memory experience along specific dimensions. For example, Reisberg, Heuer, McLean, and O’Shaughnessy (1988) asked individuals to rate memories of commonly experienced positive and negative life events (e.g. ‘unexpected death of a close friend or relative’, ‘passing some major examination in school’) on Likert scales for vividness, emotionality, and importance. Ratings of vividness increased with increasing emotionality and importance of the event, but that the valence of the emotional experience was unrelated to subjective ratings.

Similarly, Byrne, Hyman, and Scott (2001) and Tromp, Koss, Figueredro, and Tharan (1995) asked women to rate their memories of a traumatic, other unpleasant, and a pleasant event on 20+ item surveys composed mainly of items adapted from the Memory Characteristics Questionnaire (MCQ) (Johnson, Foley, Suengas, & Raye, 1988). Questions on this survey asked the women to subjectively rate their experiences in terms of sensory experience, emotion, clarity, detail, coherence, and the frequency with which the memory is recalled, among other items. In both studies the women’s subjective ratings differentiated the pleasant and unpleasant, as well as the traumatic and other unpleasant, experiences. More specifically, unpleasant memories were rated as having more negative emotions and consequences than the pleasant memories. In the Tromp et al. study, the traumatic memories were rated as less coherent, less clear, less vivid, more surprising, and less likely to be recalled than the other unpleasant memories. However, Byrne et al. found that traumatic, unpleasant, and pleasant events were rated similarly on dimensions of emotional intensity and vividness, but that the traumatic events were also rated as having more present consequences, and less talked about with family, than positive events. These studies underscore that not only are positive and negative memories rated differently, but that not all negative memories are the same. Intensity of emotion may also be an important factor.

Only three studies have directly compared actual narratives of positive to negative events. Gray and Lombardo (2001) compared written narratives of traumatic, unpleasant, and pleasant events in two groups of undergraduates: those with symptoms of
posttraumatic stress disorder (PTSD), and those without. Of particular interest to the
researchers was the hypothesis that traumatic memories are often fragmented and/or
disorganized, and that the nature of these memories may be related to the expression of
PTSD symptoms. To evaluate this hypothesis, Gray and Lombardo utilized Amir, Stafford,
Freshman, and Foa’s (1998) method of calculating narrative complexity by computing
both the reading ease index and the grade level index for the traumatic, and other two
types, of narratives. Interestingly, Amir et al. (1998) had found that women who were not
able to clearly articulate their trauma (as indicated by high reading ease and low grade
level scores) had higher levels of anxiety 2 weeks after a rape, and higher PTSD symptoms
after 12 weeks. However, after controlling for writing skill and cognitive ability, Gray and
Lombardo did not find any significant differences in the complexity of trauma narratives
either between the PTSD and no-PTSD groups, or within the groups among the three
narrative types (trauma versus negative versus positive). Nonetheless, the trauma narra-
tives were longer than both the unpleasant and pleasant narratives, and even though
participants were instructed to choose events that happened close together in time,
traumatic events were found to have occurred further in the past than the other two event
types. These results suggest that the narrated complexity of extremely negative events may
not be different than moderately negative or even positive experiences, but the amount of
information recalled for traumatic events may be greater than for non-traumatic events.
Unfortunately, these authors did not report on the content of the narratives.

Fivush, Hazzard, Sales, Sarfati, and Brown (2003) specifically examined the content of
emotionally positive and negative narratives. The researchers asked children growing up in
an inner city violent community to narrate highly negative and highly positive events
ominated by both the mother and the child. Positive events centred around school or
family outings. The negative events, on the other hand, varied from receiving allergy shots
to witnessing a gunfight between a father and grandfather. Children recalled as much
information about the positive events as the negative events. However, the negative events
focused more on internal state language, similar to that described in Pennebaker’s work
(e.g. words focusing on emotion and cognition), whereas the positive events focused more
on descriptions, objects, and people. Children also narrated the negative events more
coherently than the positive events. In contrast, Peterson and Biggs (1998) found that
children who were more highly stressed by an injury requiring emergency room treatment
subsequently narrated the event less coherently than children who were less stressed.

Porter and Birt (2001) asked undergraduates to describe their most positive and most
traumatic life event. Overall, both types of memories were vivid, coherent, and well
remembered. However, traumatic events were remembered in more detail, included more
emotional content, and were thought about more often than positive events. Positive events
contained more sensory information than the traumatic events. More specific analyses
separated the traumatic events into three groups based on the level of post-event trauma
symptoms (low, moderate, severe). These results indicated that the traumatic events
associated with the severe trauma symptoms were thought and talked about more, and
were recalled more vividly than the less severe traumas.

Narrative studies have shifted the focus from accuracy to the process and content of
recall. The pattern of results suggests that there are differences in both the subjective
ratings and the narrative content and structure of different emotional experiences.
Although there is some consensus that more intense events are rated as more vivid,
important, and emotional (although memory ratings of rape may be a special case), there
does not seem to be a clear pattern based on valence. The narrative content of positive and

negative narratives seems to differ, such that negative narratives tend to focus more on the internal landscape of emotions and cognitions, and positive narratives focus more on descriptions, objects, and people. Furthermore, the higher the subjective intensity of the event, the longer and more detailed the narrative. However, many questions remain. Most important, there have not been any studies systematically comparing narratives that differ by both valence (positive and negative) and intensity (high and low). Thus, the major objective of this research was to directly compare the same individuals narrating an array of emotional events; an intensely negative, moderately negative, intensely positive, and moderately positive event from their own life. Because this was an exploratory study, it was decided that the participants would nominate the events they were to write about. While this resulted in very different events from the participants, we examined this issue more closely in post-hoc analyses in order to provide more specific directions for future research. A second objective was to compare the content and structure of participants’ actual narratives to their subjective ratings of the emotional events. Previous research has used one methodology or the other and it is important to assess their relation in order to draw conclusions across studies.

Because so few studies have directly compared narratives of positive and negative events, few specific predictions could be made. One clear prediction was that narratives of negative events would contain more negative emotion and cognitive processing words than positive narratives. However, it was not clear how intensity might affect content. Furthermore, because previous findings are mixed with regards to narrative complexity, coherence, and length, we could not make any specific predictions on these dimensions. Research on participants’ subjective ratings of past events is more prevalent and more consistent; therefore our predictions for the subjective ratings of the four event types were more straightforward. Specifically, we predicted that the negative events, and the more intense events, would be rated as more emotional, more vivid, more unique, more significant, and more frequently talked or thought about than either the positive events or the less intense events.

**METHOD**

**Participants**

Forty-four female undergraduates at Emory University participated as partial fulfilment for the requirements of an Introductory Psychology course. The women ranged from 18–22 years of age (mean = 19.22). Twenty seven of the participants self-identified as Caucasian, seven as African-American, five Asian, three biracial, and two as Hispanic. The study included only females because previous research has shown gender differences in autobiographical narratives (see Fivush & Buckner, 2003, for a review). Thus, in order to reduce variability within the group, only females were studied. All participants signed fully informed consent.¹

¹This is part of a larger study examining relations between emotion narratives and aspects of psychological well-being. For the larger study, participants filled out several standardized assessment instruments including scales for depression, anxiety, and coping. Participants were also asked to supply saliva samples for assessment of cortisol levels.
**Procedure**

Participants were shown to a room in groups of three to five, and asked to nominate four personally experienced events that varied along two dimensions, valence and intensity level, yielding an intensely negative experience, a moderately negative experience, an intensely positive experience, and a moderately positive experience. The order of the events was counterbalanced such that half of the participants (22) wrote about positive events first, and half (22) wrote about negative events. Within those two groups, half (11) wrote about the intensely emotional experience first, and half (11) wrote about the moderately emotional experience first. Following procedures developed by Pennebaker (as reviewed in Pennebaker, 1997), they were asked to write about each event continuously for 10 minutes, not to worry about spelling and punctuation, and to incorporate both the facts of what happened and their thoughts and feelings about the events. All participants complied with these instructions and all wrote about each event for the full 10 minute period.

After all four events were written about, the participants filled out 1–7 point Likert scales on which they rated each event according to: 1) the frequency with which the event had been talked or thought about; 2) the personal significance of the event; 3) the uniqueness of the event; 4) the emotional intensity of the event; and 5) the vividness of the event in their mind.

**Coding**

**Content**

All four events from each participant were transcribed verbatim and the content was coded using the Linguistic Inquiry and Word Count program (LIWC) developed by Pennebaker and Francis (1996). This is a computer based word count program that matches all written transcripts against an extensive dictionary, and provides the percentage of words in a large set of categories and sub-categories. Development of this computer counting system has shown it to be reliable and exhaustive in its counts, categorizing approximately 85% of specific words used in a wide corpus of narratives.

Based on previous research and our predictions, four specific variables were examined: 1) overall word count; 2) the overall category of negative emotion (e.g. hate, afraid, sad); 3) the overall category of positive emotion (e.g. happy, love, pride); and 4) the overall category of cognitive processing words (e.g. because, understand, comprehend).

**Structure**

Narrative structure was conceptualized in two ways, as complexity and coherence. Complexity refers to the level of grammatical and semantic structure inherent in the narrative, and coherence refers to the overall organization of the narrative.

To assess complexity, all event narratives were processed using a standard word-processing software program (Microsoft Word 2000) to compute Flesch Reading Ease (FRE; Flesch, 1949) and Flesch-Kincaid Grade Level (FKGL) scores. Both scores are calculated using average sentence length (number of words divided by number of sentences) and the average number of syllables per word (number of syllables divided by number of words). FRE scores range from 0–100 with higher scores reflecting text that is easier to read. Standard documents typically receive scores of 60–70. FKGL reflects the grade-school level of the text (e.g. a score of 7 means that a seventh grader could
understand the document). Standard documents are typically written at the seventh-to-eighth grade level. Finally, as a more exploratory measure, we calculated the percentage of passive sentences. We hypothesized that passive sentence structure might be used to distance oneself from the emotional impact of an event, and thus would be more likely to be used in narrating negative than positive experiences.

To determine overall coherence, each event narrative was coded for both chronology and completeness. Chronology referred to the temporal order of the event, and completeness referred to the amount of detail provided, and whether any parts of an event were left out. Both dimensions were incorporated into one rating because the two variables tended to covary, with narratives either organized chronologically with a lot of detail, or completely out of order with almost no detail. Thus, one rating was sufficient to capture the overall coherence of the narratives. Ratings were on a scale from 1–4.

1 = Narrative is very disorganized and unclear. It also has very few details and may be difficult to follow.

2 = Narrative is significantly lacking in either chronology or completeness. For example, a major part of the story is missing, or major events are recounted out of order.

3 = Narrative has a sense of chronology as well as some detail. It is still lacking in either one or both dimensions.

4 = Narrative follows a clear chronological order, giving a complete account of the event, along with extensive detail.

Two independent coders rated each narrative. An intraclass correlation was computed to assess reliability, with alpha = 0.88. All disagreements were resolved through discussion.

RESULTS

Presentation of the results is divided into five sections. We first describe the events participants selected. The following three sections address the major hypotheses of the study. The first of these sections addresses differences among event types with regard to the narrative variables; the second presents analyses on the subjective ratings (including the number of years since the event occurred); the third section examines interrelations of narrative variables and subjective ratings among event types. The last section is more exploratory in nature, examining how the severity of the intensely negative events affected narrative variables and subjective ratings.

Description of events

Because participants freely nominated events from their own lives, the selected events varied. Seven categories were formed in order to capture the types of events that were reported. Table 1 displays these seven categories, as well as the number of events classified under each by valence and intensity. The first four categories represent typical life experiences, both positive and negative. The most frequently described events fell under

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2Events also differed by duration; events were classified as a Single Event/One Day (e.g. winning one sports game), a Repeated Event (e.g. winning many different sports games in a season), or an Extended Event (e.g. one tournament lasting a weekend). Because analyses indicated that this categorization of the events was not related in a meaningful way to any other variables of interest, it will not be discussed further. However, more information is available upon request.
the category of Relationships and included events such as the beginning of a romantic relationship (positive) and a fight with a friend (negative). The Achievements/Failures category contained events such as getting into college (positive), or not performing as well as expected in academics (negative). Family Events encompassed weddings and family trips (positive) as well as normative family deaths (e.g. death of a grandparent; negative). Study abroad experiences (positive), and mishaps on vacations (negative), are included under the category Travel.

The last three categories represent only negative experiences. The Accidents/Illness category included serious, unexpected/untimely accidents, illnesses, or deaths. Examples of these events are the death of a sister, the suicide of a friend, or being diagnosed with leukemia. Sexual Violence represented unwanted sexual experiences, and ranged from childhood molestation, to stranger rape, to repeated sexual abuse by a family member. The final category, Property Damage, included a house robbery and a home burning down. Of the 32 events categorized into these final three categories, 20 were nominated as intensely negative events and 12 as moderately negative. It is important to emphasize that even though these events were nominated by undergraduates coming from rather privileged backgrounds, 19 of the intensely negative events could be classified as traumatic according to the Diagnostic and Statistical Manual of Mental Disorders-IV-TR (DSM-IV-TR) traumatic event exposure criterion for PTSD, in that the woman ‘experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others’, and her ‘response involved intense fear, helplessness, or horror’ (American Psychiatric Association, 2000, p. 467) (examples in the present study include rape by multiple perpetrators, death of a sister, home burning down). We will return to this issue later in the results, and in the discussion section.

### Narrative variable analyses

The first set of analyses examined the content and structure of the narratives as a function of intensity and/or valence of emotion on eight theoretically relevant variables: Word Count, Positive Emotion, Negative Emotion, Cognitive Mechanisms, FRE, FKGL, percentage of Passive Sentences, and Coherence. Means and standard deviations for each measure are shown in Table 2 by Narrative Type. A 2 (valence) × 2 (intensity) Analysis of Variance (ANOVA) was conducted on each narrative variable.

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Table 1. Number of events falling into each category by narrative type

<table>
<thead>
<tr>
<th>Category</th>
<th>Negative</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intense</td>
<td>Moderate</td>
</tr>
<tr>
<td>Relationships</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Achievements/failures</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Family events</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Travel</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Accidents/illnesses</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Sexual violence</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Property damage</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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Memories of emotional events  

Analyses revealed that, for content, the negative narratives were longer than the positive narratives ($F(1, 43) = 4.29, p < 0.05$), and the intensely emotional narratives were longer than the moderately emotional narratives ($F(1, 43) = 4.09, p < 0.05$); there was no significant interaction of valence and intensity. The positive narratives contained more positive emotion than the negative narratives ($F(1, 43) = 124.91, p < 0.01$), and the negative narratives contained more negative emotion than the positive narratives ($F(1, 43) = 96.49, p < 0.01$). For Cognitive Mechanisms, a significant main effect of valence and a significant interaction of valence and intensity revealed that overall, the negative narratives contained more words reflecting cognitive processing than the positive narratives ($F(1, 43) = 12.16, p < 0.01$), and this effect was greater for the moderate than for the intense events ($F(1, 43) = 6.28, p < 0.05$).

On the structure measures, although the negative narratives received higher reading ease scores than the positive narratives ($F(1, 43) = 6.95, p < 0.01$), there were no significant findings regarding grade level. However, negative narratives contained more passive sentences than the positive narratives ($F(1, 43) = 5.02, p < 0.05$), and there was a significant interaction of valence and intensity ($F(1, 43) = 7.98, p < 0.01$) which revealed that the moderately negative and moderately positive narratives did not differ in percentage of passive sentences, but the intensely negative narratives had more passive sentences than the intensely positive narratives which did not differ from the moderate narratives. Finally, the moderately negative and moderately positive narratives did not differ in coherence, but the intensely positive narratives were more coherent than the intensely negative narratives which did not differ from the moderate narratives ($F(1, 43) = 9.65, p < 0.01$).
Rating scale analyses

The second set of analyses examined women’s subjective memory experiences of the different events measured in terms of the five rating scale factors: Frequency of talking/thinking about the event, Significance, Uniqueness, Emotionality, and Vividness of the event. Means and standard deviations for each of these ratings by Narrative Type are shown in Table 3. A 2 (valence) × 2 (intensity) ANOVA was conducted on each rating scale variable.

The intensely emotional events were rated as more significant ($F(1, 43) = 56.01, p < 0.01$), unique ($F(1, 43) = 21.35, p < 0.01$), and vivid ($F(1, 43) = 10.28, p < 0.01$) than the moderately emotional events. For Emotion, main effects of both valence and intensity (but no significant interaction) revealed that the negative events were rated as more emotional than the positive events ($F(1, 43) = 19.16, p < 0.01$), and the intensely emotional events were rated as more emotional than the moderately emotional events ($F(1, 43) = 51.36, p < 0.01$). A significant interaction of valence and intensity was found for the Frequency of talking/thinking about the event such that whereas women rated themselves as having talked/thought about the intensely negative and moderately negative events with equal frequency, the intensely positive events were talked/thought about more than the moderately positive events ($F(1, 43) = 5.00, p < 0.05$).

Table 3. Means (standard deviations) for rating scale variables by narrative type

<table>
<thead>
<tr>
<th>Scale variables</th>
<th>Intense</th>
<th>Moderate</th>
<th>Intense</th>
<th>Moderate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>4.36</td>
<td>4.16</td>
<td>4.93</td>
<td>3.68</td>
</tr>
<tr>
<td></td>
<td>(1.91)</td>
<td>(1.78)</td>
<td>(1.73)</td>
<td>(1.61)</td>
</tr>
<tr>
<td>Significance</td>
<td>6.45</td>
<td>5.23</td>
<td>6.59</td>
<td>5.30</td>
</tr>
<tr>
<td></td>
<td>(1.13)</td>
<td>(1.52)</td>
<td>(0.76)</td>
<td>(1.27)</td>
</tr>
<tr>
<td>Uniqueness</td>
<td>6.14</td>
<td>4.77</td>
<td>5.82</td>
<td>5.25</td>
</tr>
<tr>
<td></td>
<td>(1.56)</td>
<td>(2.19)</td>
<td>(1.76)</td>
<td>(1.92)</td>
</tr>
<tr>
<td>Emotion</td>
<td>6.70</td>
<td>5.61</td>
<td>6.02</td>
<td>4.77</td>
</tr>
<tr>
<td></td>
<td>(0.59)</td>
<td>(1.22)</td>
<td>(1.25)</td>
<td>(1.43)</td>
</tr>
<tr>
<td>Vividness</td>
<td>6.25</td>
<td>5.55</td>
<td>6.23</td>
<td>5.73</td>
</tr>
<tr>
<td></td>
<td>(1.22)</td>
<td>(1.42)</td>
<td>(1.20)</td>
<td>1.35</td>
</tr>
<tr>
<td>Time Years</td>
<td>4.20</td>
<td>2.73</td>
<td>2.61</td>
<td>2.57</td>
</tr>
<tr>
<td></td>
<td>(3.30)</td>
<td>(3.39)</td>
<td>(2.78)</td>
<td>(2.64)</td>
</tr>
</tbody>
</table>

3Correlational analyses were run to examine interrelations of the narrative content variables, and revealed that Word Count was the only consistent narrative variable across all four narrative types, such that those women who wrote extensively (or minimally) did so throughout the experiment. Analyses run to determine the relations between the subjective rating scale variables across narrative types did not reveal any interpretable pattern based on valence or intensity. Correlations among the rating scale variables within each narrative type revealed that for the intensely emotional events many of the rating scale variables were intercorrelated, whereas for the moderately emotional events they were not. Details of these analyses are available from the authors.
Year of occurrence
It is possible that narrative content and structure and subjective ratings were related to when the event occurred. The mean lengths of time in years since the events occurred are also displayed in Table 3. A 2 (valence) × 2 (intensity) ANOVA on the number of years since the event occurred was not significant; the number of years since the event occurred is not related to either intensity or valence.4

Relations between narrative variables and rating scale variables
A critical question is whether the narrative variables are related to the subjective ratings. Correlations were computed among these variables within each of the four narrative types, yielding a total of 172 bivariate correlations. However, only seven of these reached significance, which is fewer than would be expected by chance.5 Thus, there were virtually no relations between the narrative variables and the women’s subjective ratings of these events.

Severity of intensely negative events
A final issue concerns the variability in the severity of negative life events nominated. Because previous research has suggested that life events nominated as ‘traumatic’ within non-clinical populations may not be commensurate with clinically-defined traumatic events (Butler & Wolfner, 2000), the first two authors examined the 44 intensely negative events and compared them to the DSM-IV-TR definition of a traumatic experience, as described above. The researchers agreed that in total, 19 of the 44 intensely negative events met DSM-IV-TR criterion and were thus deemed traumatic. T-tests were run to compare these traumatic events to the more common intensely negative life experiences (e.g. end of a romantic relationship, failing in school) on the narrative content and structure variables and the rating scale variables (including number of years since occurrence) (see Tables 4 and 5). Only two significant differences between the groups were found. Traumatic events contained significantly less positive emotion than the non-traumatic events (t(42) = 3.06, p < 0.01), and the traumatic events occurred significantly further in the past than the non-traumatic events (t(42) = 2.67, p < 0.01).

DISCUSSION
The major objective of this study was to compare the narratives and subjective ratings of women’s event memories differing by both emotional valence and intensity. Overall, emotional valence was related to the content of the women’s narratives, and emotional intensity was related to the subjective ratings of the memories. More specifically, negative narratives contain more negative emotion, cognitive processing words, and passive sentences than positive narratives, and positive narratives contain more positive emotion words and are more structurally complex than negative narratives. Intensely negative

4Correlations between years since occurrence and narrative content variables and subjective ratings were also computed within each event type. Virtually none of these correlations reached significance.

5Correlations between the narrative content variables and the rating scale variables within each of the four event types are available from the authors upon request.
narratives are the longest and least complex, and intensely positive narratives are the most coherent. In contrast, when subjectively rating their memories, women rated both intensely negative and intensely positive events, in general, as more frequently talked/thought about, significant, unique, emotional, and vivid than moderately emotional events,

Table 4. Means (standard deviations) and significance levels for comparison of traumatic and non-traumatic intensely negative events for narrative variables

<table>
<thead>
<tr>
<th>Intensely negative event</th>
<th>Traumatic</th>
<th>Non-traumatic</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word count</td>
<td>285.16</td>
<td>276.20</td>
<td>0.44</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(66.44)</td>
<td>(68.26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pos emotion</td>
<td>1.52</td>
<td>2.54</td>
<td>-3.06</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>(0.68)</td>
<td>(1.32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neg emotion</td>
<td>2.27</td>
<td>3.00</td>
<td>-1.5</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(1.41)</td>
<td>(1.70)</td>
<td></td>
<td></td>
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<tr>
<td>Cog mech</td>
<td>7.04</td>
<td>7.17</td>
<td>-0.15</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(3.16)</td>
<td>(2.58)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Structure variables</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>F. Reading Ease</td>
<td>79.45</td>
<td>76.10</td>
<td>1.38</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(6.99)</td>
<td>(8.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. K. Grade Level</td>
<td>6.06</td>
<td>6.95</td>
<td>-1.44</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(1.83)</td>
<td>(2.15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent passive</td>
<td>8.84</td>
<td>6.32</td>
<td>1.00</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(7.61)</td>
<td>(8.73)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coherence</td>
<td>3.42</td>
<td>3.2</td>
<td>1.04</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(0.69)</td>
<td>(0.71)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns = non-significant.

**p < 0.01.

Table 5. Means (standard deviations) and significance levels for comparison of traumatic and non-traumatic intensely negative events for rating scale variables (and time)

<table>
<thead>
<tr>
<th>Intensely negative event</th>
<th>Traumatic</th>
<th>Non-traumatic</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>4.68</td>
<td>4.12</td>
<td>0.97</td>
<td>ns</td>
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<tr>
<td></td>
<td>(1.97)</td>
<td>(1.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>6.74</td>
<td>6.24</td>
<td>1.46</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(0.73)</td>
<td>(1.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uniqueness</td>
<td>6.53</td>
<td>5.84</td>
<td>1.46</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(1.43)</td>
<td>(1.62)</td>
<td></td>
<td></td>
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<tr>
<td>Emotion</td>
<td>6.89</td>
<td>6.56</td>
<td>1.91</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(0.46)</td>
<td>(0.65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vividness</td>
<td>6.37</td>
<td>6.16</td>
<td>0.56</td>
<td>ns</td>
</tr>
<tr>
<td></td>
<td>(1.46)</td>
<td>(1.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years</td>
<td>5.63</td>
<td>3.12</td>
<td>2.67</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>(3.95)</td>
<td>(2.24)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns = non-significant.

**p < 0.01.
and negative events were rated as more emotional than positive narratives. Interestingly, there was little relation between the objective content of the narratives and the women’s subjective ratings of their memory experiences.

Gray and Lombardo (2001) also found that negative narratives were longer than positive narratives, but Fivush et al. (1999) found no differences in length. However, Fivush et al. found that negative events were more coherent than positive events, and Peterson and Biggs (1998) found that higher levels of stress related to lower coherence. Further, Gray and Lombardo (2001) found no differences in narrative complexity, whereas narrative complexity was a critical variable in predicting psychological outcome in Amir et al. (1998). How can we reconcile these various findings? One possibility, suggested in the introduction, is that negative events pose a problem to be solved. In order to cope with the aversive affect, individuals may need to work through the event, reflecting on how and why the event happened and how they feel about it. Pennebaker’s research (Francis & Pennebaker, 1992; Pennebaker & Beall, 1986; see Pennebaker, 1990 and 1997 for reviews) has shown that individuals who evidence changes in the use of emotion and cognitive processing words in narratives of stressful events subsequently show better physical and psychological outcome.

In this study, intensely negative events included more negative emotion and cognitive processing words, perhaps indicating higher levels of processing, yet at the same time the higher percentage of passive sentences and decreased structural complexity further suggest that these women were still struggling to create a personally meaningful and articulated account of what occurred. Further, this study found the negative event narratives to be longer, and to be rated as more emotional, than the positive events. Taken together, this suggests that these women may still be working through the event and trying to come to terms with it so that the event can be integrated into their life story. Future research should examine whether these variables can be used as indices of coping. On the other hand, the comparative lack of these characteristics in the positive event narratives may indicate that positive events do not need to be worked through; rather, positive events can be incorporated into the life story without having to solve a problem and without working to understand the facts and feelings surrounding the event. Thus, narratives differ by valence because of the way in which positive and negative memories are integrated into one’s larger autobiographical life story.

However, with one exception, namely that negative events were rated as more emotional than positive events, all of the subjective ratings varied by intensity and not valence. As predicted, and similar to previous findings (Reisburg et al., 1988; Tromp et al., 1995), we found that women rated intensely emotional events as more frequently talked and thought about, significant, unique, emotional, and vivid than moderately emotional events. In some sense this may be due to our methodology. Because women were asked to nominate intensely and moderately emotional experiences, it makes sense that those memories that subjectively feel more intense should be rated this way. However, it is interesting to note that, overall, negative memories subjectively feel more emotional than do positive memories. Perhaps negative emotion is more long lasting and/or more intense in general than is positive emotion.

But surprisingly, there was little relation between the narrative variables and the women’s subjective ratings of their memory experiences. We expected to see at least some relation between the two forms of measurement. However, this may be more of a methodological than a theoretical issue about memory reporting. Our scale ratings asked women to reflect upon their memories at a meta-cognitive level, and their narratives of
their experiences do not match these ratings. Only one other study has examined relations between narrative content and subjective ratings. Mennuti-Washburn (Mennuti-Washburn, unpublished thesis, 2001) found relations between women’s narratives of sexual assault and their subjective ratings of their experiences using the MCQ (Johnson et al., 1988). The MCQ differs from the ratings used in the present study in that it asks concrete, specific questions such as, ‘My memory involves sound (1) Little or none—(7) A lot’, and, ‘As I am remembering now, to what extent am I re-experiencing in my mind or body the emotions or feelings that I had during the event (1) No re-experiencing — (7) Complete re-experiencing’ which factor analyze into four components of memory: affect, re-experiencing, non-visual sensory information, and clarity.

This raises the important methodological question as to what aspects of memory are being tapped through the use of these different forms of measurement. In this and most other studies, subjective ratings require participants to condense their entire memory experience into very few, global responses. But an increasing number of studies are using more fine-grained, specific, and concrete questions, which may be better at differentiating between types of memories (e.g. Byrne et al., 2001; Tromp et al., 1995). These more specific questions may also better relate to narrative variables. Our results indicate that we need to take into account both narrative variables and subjective rating scales when asking participants to describe events from their past. Both provide important, yet possibly distinct, information.

Interestingly, of the intensely negative narratives in the present study, almost half (19 of 44) can be classified as traumatic experiences. To date, only one study has directly compared narratives of trauma to narratives of other unpleasant events, and did not reveal any differences in writing complexity between the groups (Gray & Lombardo, 2001). Similar to that study, we did not find differences between women’s narratives of traumatic and other intensely negative events, with the exception that the trauma narratives contained less positive emotion. However, both Byrne et al. (2001) and Tromp et al. (1995) found that traumatic memories were subjectively rated as different from positive and negative memories in that they were less clear, less talked/thought about, and less vivid. Again, this suggests that narrative variables and subjective ratings may provide different information about emotional memories. It should also be noted that all of the participants in Tromp et al. rated a traumatic memory concerning rape, and because the present study only had five intensely negative memories of sexual assault, a direct comparison cannot be made.

Related to this, the definition of ‘trauma’ or ‘intensely negative’ is critical to the results of our study and those of others. When nominating intensely negative events, many women chose to write about characteristically distressing events (e.g. a death, abuse, failing at something important). Other women had different, and rather unexpected, views as to what constituted an intensely negative event. For example, one woman wrote about the suicide of a close friend as her moderately negative event, and a fight with another friend as the intensely negative event. While one might expect these last two events to be reversed, to this woman, the fight with her friend may have had more negative consequences for her life than her other friend’s suicide. Recent research has found that events that participants themselves labeled as traumatic (e.g. death of a pet), were remembered in more detail than those events labeled as traumatic by the researchers (e.g. sexual abuse) (Reviere & Bakeman, 2001). The results of the present study are similar to these findings; participants’ self-nominated intensely negative events differed from other narrative types, whereas researcher-defined traumatic events do not differ from
other intensely negative events. Moreover, it is possible that participants would self-nominate different events if asked to recount traumatic versus negative events, for example. In the present study, we asked participants to recount the most negative experience of their life, rather than asking for the most traumatic, which may have influenced the types of events that the women reported. Clearly, more research is needed to examine whether the wording used to elicit narratives can affect the types of events that are self-nominated, for both positive and negative events.

Finally we must address the variability of the events examined in this study. Because we were interested in how memories vary by valence and intensity, it seemed critical to allow participants to self-select memories from their own lives that they defined as falling into these categories. Certainly, our results indicate that self-defined emotional memories may be different than researcher-defined emotional memories. In fact, even though the intensely negative events occurred the furthest in the past they were the longest narratives. This is consistent with past research that suggests intensely negative events are remembered over long periods of time, and in much detail (e.g. Peterson & Whalen, 2001; Porter & Birt, 2001). One reason that emotional memories may be well retained over long periods of time may be because of the intensity and importance of the events. The women in this study rated these events as more frequently talked and thought about, suggesting that these intensely emotional events come to mind more often, and thus are rehearsed and subsequently remembered in much detail over long periods of time.

However, there are several limitations that need to be addressed. One of the text analysis programs used in this study, LIWC, has a limited range of functions; it simply counts words regardless of the context, sentence structure, or narrative structure in which they appear. Future analyses should include coding for the context within which emotion and cognitive processing words occur in the narratives. Furthermore, the participants were predominantly white, middle- and upper-middle class women between 18 and 21 enrolled full-time at a private university. While these women have experienced intensely emotional events, and a surprising number of traumatic events, they presumably have many more resources to cope with these than the general population (e.g. extensive support systems, higher levels of education/problem-solving skills). Extending this research to males as well as to a more diverse population is necessary, and other individual difference factors, such as trauma history/exposure as well as the subjective impact of the event, should also be examined.

In summary, this study helps to clarify how emotion and memory are related in real world contexts. Narrative variables were more affected by emotional valence, whereas subjective ratings were affected by emotional intensity. However, there were very few relations between the objective content of the narratives and the subjective ratings of the memory experiences. Intriguingly, events categorized as traumatic post-hoc did not differ from other intensely negative events, but events nominated by the women as intensely negative differed from other memories in important ways. This emphasizes that the individual’s subjective experience of stress, rather than a researcher’s classification of events, seems to discriminate between memories for different events. Most importantly, the results of this study are also important in a larger life context. Our subjective experiences of, and subsequent ruminations about, different events determine how we represent past events, and the impact they will have on our lives. The results of this study, as well as others reviewed here, can help us to better understand and more effectively cope with negative life experiences, and to maximize the benefits we can extract from positive experiences.
ACKNOWLEDGEMENTS

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REFERENCES


