

## THE ROLE OF STORY-MAKING IN DISCLOSURE WRITING: THE PSYCHOMETRICS OF NARRATIVE

ANNA GRAYBEAL\*, JANEL D. SEXTON and JAMES W. PENNEBAKER†

*Department of Psychology, The University of Texas, Austin, TX 78712*

Writing about self-relevant emotional topics has a wide range of mental and physical health benefits. An appealing explanation for this phenomenon is that writing facilitates 'story-making' – the ability to make coherent and meaningful stories out of events in one's life – and it is forming a good story that promotes the health benefits. Despite the recent attention to this idea, the psychometrics and correlates of story-making are not known. The purpose of the current study was to explore this idea by measuring participants' story-making ability when writing about both emotional and unemotional topics and relate this to health, personality variables, and linguistic dimensions. Story-making was reliably assessed by independent raters, except for nonemotional topics. The ability to make good stories was not, however, consistent across topic, and story-making did not correlate with personality dimensions nor did it predict the health outcomes of participants.

*Keywords:* Story-making; Psychometrics

Writing about emotional topics has been demonstrated to have a wide range of benefits, including reduction in doctor visits, improved immune system functioning, achievement of better grades, and faster acquisition of a new job (see Pennebaker, 1997 and Smyth, 1998 for reviews). Various theories about the mechanisms by which writing exerts its positive effects have been proposed, including an inhibition theory and a cognitive change theory. Both theories are derived from the ideas that writing helps relieve the stress or other difficulties associated with not disclosing or that it helps making sense of a chaotic emotional experience.

The inhibition theory is based on the assumption that not disclosing important psychological experiences is a form of inhibition, which requires physiological work. This physiological work has been hypothesized to be a long-term stressor which may cause or exacerbate psychosomatic processes leading to illness or ineffective functioning (Pennebaker, 1989). In support of this theory, research suggests that individuals who do not naturally talk about their emotions to others may benefit more than those who are more naturally open. For example, a meta-analysis of writing studies by Smyth (1998) suggests that men may benefit more from writing than women.

---

\*Corresponding author. E-mail: graybeal@mail.utexas.edu

†E-mail: pennebaker@psy.utexas.edu

In addition, studies have indicated that those high in hostility (Christensen and Smith, 1993) and in the trait of alexithymia (Paez *et al.*, 1999) benefit more from emotional writing than those low in these traits. Although some evidence has accumulated in support of this theory, it does not provide a complete explanation for the benefits of writing.

The cognitive change theory postulates that writing helps people reorganize their thoughts and feelings about traumatic experiences and create more coherent or meaningful narratives about the events in their lives (Pennebaker and Seagal, 1999). The notion that the creation of coherence and/or meaning is therapeutic has a long tradition in psychology dating back to Freud (Bucci, 1995). The creation of meaningful narratives may be beneficial for a number of reasons, which are not necessarily mutually exclusive. For example, creating meaning may provide a greater sense of control or may reduce the work required to process or store disorganized information. Support for the idea that cognitive changes are brought about by writing comes both from reports by participants that writing forced them to think about events differently (Pennebaker, 1989) and the finding that participants who discussed emotional topics (either through writing or by talking to a therapist) were rated as showing greater understanding of their problem than participants who discussed superficial topics. Nonetheless, more focused efforts to identify the cognitive changes brought about by writing have been unsuccessful. For example, Pennebaker and Francis (1996) found no performance differences on topic-relevant cognitive tasks between participants who wrote about emotional versus superficial topics. The effects of additional mechanisms by which writing might induce cognitive changes that lead to positive health outcome remain to be tested.

There is recent interest in exploring whether story-making plays a role in explaining the health benefits of emotional writing. There is a history of the study of meaning-finding and story-making in psychology, especially in the areas of constructivist and narrative psychology (Gergen and Gergen, 1997). The constructivist approach proposes that people try to organize confusing and upsetting events in their lives in meaningful ways (Mahoney, 1995). Indeed, the narrative approach argues that finding a sense of meaning is critical for those who are coping with a major life tragedy (Neimeyer, 1999). The creation of a life story has also been linked to mental well-being (McAdams, 1996).

Researchers studying the health benefits of writing have also explored the role of story-making. For example, Pennebaker *et al.* (1997) found that health improvement was associated with word use patterns indicating that participants were creating meaningful stories: the more participants increased their use of words having to do with gaining insight (e.g., realize, understand, reconsider, see) and words associated with causal relationships (e.g., because, reason, cause, why, thus), the more their health improved. Smyth *et al.* (in press) evaluated the role of narrative structuring by experimental manipulation and found that the self-reported health of people who wrote about a traumatic experience in a narrative fashion was better than for those who wrote about this topic in a disjointed, list-like way.

Additional support for the idea that health benefits may follow the production of meaningful narratives during writing came from an unexpected finding by Pennebaker and Francis (1996). In this study, students wrote for three days about either emotional or trivial topics. Those assigned to the emotional condition were more likely to evidence improved physical health in the months after writing if they increased their use of causal and insightful words from the first to the last

day of writing. Those in the non-emotional control condition, however, were more likely to evidence *worse* health if they increased their use of causal and insightful words across the three days of writing.

Although never directly tested, it was assumed that an increasing use of causal and insightful words reflected the building of a narrative. These findings therefore, raised the possibility that a powerful individual difference related to story-making or narrative construction underlies the health effects. That is, people who make good stories when asked to write about emotional topics subsequently evidence improved health, whereas when given superficial topics these good story-makers actually show poorer health, perhaps because the effort expended to make a story out of trivial material is ultimately frustrating and unnecessarily stressful (Pennebaker and Francis, 1996). Because the Pennebaker and Francis study used a between-subjects design, it was not possible to know if the people who benefitted from writing in the experimental condition were the same types of people who would have been least likely to benefit in the control condition.

Several intriguing problems, then, are explored in this study. The first is whether story-making in one domain is related to story-making in another. That is, are those people who naturally make good stories when writing about emotional topics the same people who make good stories when writing about superficial topics? Second, what linguistic patterns are markers of good stories? And last, does story-making explain the mental and physical health benefits of writing? In short, we set out to investigate the basic psychometric properties of story-making and narrative, and explore their relationship to health.

This study addresses the following hypotheses:

1. Story-making is a characteristic that can be reliably assessed by independent judges.
2. Story-making is an individual difference that appears across different topics.
3. Story-making will moderate the relationship between health and writing topic such that better story-makers will show more health improvement after writing about an emotional topic and more health decrement after writing about an unemotional topic.

## METHOD

### Overview

Fifty-two undergraduates were asked to write about both an emotional and an unemotional topic for 20 min a day on each of three days per topic, in counter-balanced order, separated by five weeks. Prior to the 3-day writing assignments, all participants were asked to write stories on each of two pictures. The degree to which all writings were written as stories was assessed by judges. Health center illness records, self-reports, health-related behaviors, and personality measures were collected before and during the experiment.

### Participants

The sample consisted of 52 undergraduates (23 females and 29 males) who participated in the experiment to satisfy a requirement of their introductory psychology class at

a large university. Three additional participants were dropped because they did not complete all essays across both writing periods.

### Procedure

The experiment was conducted during the fall academic semester. The first writing period was conducted approximately five weeks into the semester, and the second was conducted another five weeks later. On the first day of their first writing period, participants were brought into the laboratory and asked to fill out five questionnaires: (i) the Trait Meta-Mood Scale (Salovey *et al.*, 1995), which measures individual differences in the ability to reflect upon and manage one's emotions, (ii) the Toronto Alexithymia Questionnaire (Taylor *et al.*, 1985), which measures whether a person has difficulty identifying and describing his/her feelings, (iii) the Need for Cognition Scale (Cacioppo and Petty, 1982), a measure of the degree to which participants tend to engage in and enjoy thinking, (iv) the College Adjustment Test (Pennebaker *et al.*, 1990), a measure of students' experiences with various thoughts and feelings about coming to college and (v) the NEO-FFI Five-Factor Personality Inventory (Costa and McCrae, 1992). During this initial laboratory session, participants were also asked to write two essays in a story format about each of two pictures they were shown. One picture was a drawing of two people, and the second was an inkblot. Our instructions for both picture essays were:

"What is going on in this picture? Let your imagination go, and try to come up with as much explanation about what is happening as possible. Explain what led up to the present situation, and describe how it will turn out. Spend 5 min (no more, no less) writing down your story."

As participants left the laboratory, they were randomly assigned to a writing topic, such that approximately half the participants wrote first about an emotional topic and the remaining half wrote first about an unemotional topic. They were asked to write about the assigned topic on each of three consecutive days for 20 min each time. On each day we sent the participant an e-mail message to which we asked them to reply with their writing. For the emotional writing condition, our message said:

"For the next 20 min, please write about your deepest thoughts and feelings about the most emotionally significant experience in your life. Explore how this experience ties in to your childhood, traumatic experiences in your lifetime, and relationships with others. Also try to relate the experience to who you are as person, and who you would like to be. We would like you to really try to get in touch with your emotions and deepest thoughts about this experience. Please write without stopping and don't worry about grammar or punctuation. Remember, you will only have three days to write about these issues."

The messages for days 2 and 3 simply asked the participants to continue exploring their deepest thoughts and feelings about their experience. For the unemotional writing condition, our message said:

"For the following three days we want you to write about how you manage your time. Today, for the next 20 min, please write about how you managed your time for the last 24 h. Do not explore your emotions or feelings; please try to be completely objective and descriptive. Go into as much detail as possible. Please try to write without stopping and don't worry about grammar or punctuation."

Messages for days 2 and 3 asked the participants to write about how they planned to manage their time for the next 24 h, and for the next week, respectively. Again, they returned their writings over e-mail.

Five weeks after the first three days of writing, all participants began another set of writings. The group that had written about the emotional topic in the first period switched to writing about the unemotional topic and vice versa. The procedure for requesting their writings was identical. After each participant had completed all three writings on a particular topic, we electronically mailed them an 'After-Writing Questionnaire' to assess their moods and beliefs concerning their essays and the experiment. This questionnaire has been used in nearly all previous writing studies, and consists of questions such as "How personal were your essays?", "How emotional were your essays?", "How difficult was it for you to get into your writings?", and "How valuable did you find the writing experience?" (Pennebaker *et al.*, 1990). This questionnaire was returned to us by e-mail.

A record of each participants' visits to the university health center was obtained at the close of the spring semester. In addition we collected a record of self-reported doctor visits and health behaviors from a 'Health Behaviors Questionnaire' administered three times during the study: at the beginning of each week of writing and on the last day of classes, four and a half weeks after the second writing. This questionnaire contains items such as "How many times have you visited the doctor for illness or injury?", "How many doses of prescription/non-prescription drugs have you taken?", "How many nights have you had difficulty sleeping?", and has been used in many previous writing studies (Pennebaker *et al.*, 1990). At the end of the semester, participants were fully debriefed and asked about their experience with the study.

### Judges' Ratings of Essays

The degree to which the two essays written to describe pictures formed good stories was rated by four judges, where 'good story' was defined as a narrative with a clear beginning, middle, and end. The judges rated each picture essay on this one dimension using a unipolar scale ranging from 1 = *not at all* to 7 = *a great extent*.

Participants' essays about emotional and unemotional topics were rated for the degree to which they formed good stories by a different set of four judges using 9 questions in addition to the item reflecting storyness, as indicated above. Judges rated each participant's set of three essays on a given topic as a whole (rather than rating each individual essay separately). The emotional and non-emotional writing samples were judged at different times and judges were unable to link the two sets of essays. For each set of three essays, the judges used a 7-point unipolar scale to answer the following 10 questions: (a) to what degree does this essay tell a story (where, as above, a good story was defined as having a clear beginning, middle, and end)?; (b) to what degree does this essay have a moral or a message?; (c) to what degree is this essay 'a good read' (e.g., is it intriguing, interesting, titillating, etc.)?; (d) to what degree does the author seem to take the writing seriously?; (e) if you were a clinician, to what degree would you think the author was mentally healthy?; (f) how socially integrated does the author seem (where that means having positive and emotionally meaningful relationships with others)?; (g) to what degree does any growth or change seem to happen through or across the three days of writing?; (h) to what degree did the author write about the same event and/or theme across the three days?; (i) to what degree is the author insightful?; (j) to what degree is the author conflicted?

### Computer Text Analysis

In addition to judges' ratings, all writings were analyzed by a computerized text analysis program called Linguistic Inquiry and Word Count (LIWC; Pennebaker and Francis, 1996). The LIWC program consists of a main text processing module and an external support dictionary. The dictionary file is composed of over 2000 words and/or word-stems that are assigned to one or more of 72 scales. Each of these scales is composed of groups of related words that tap a particular dimension of language, such as negative emotion or positive emotion. LIWC calculates the total number of words, sentences, percentages of unique words, and dictionary words. The sums of each of the scales are converted to percentage of total words (Pennebaker and Francis, 1999).

## RESULTS

### Manipulation Checks

Participants rated their emotional essays as significantly more personal and emotional than their unemotional essays, regardless of the order in which they wrote on these topics,  $F(1, 49) = 75.53, p < 0.01$ ;  $F(1, 49) = 273.61, p < 0.01$ . Analyses using LIWC revealed that, as expected, the emotional essays contained significantly more positive and negative emotion words than the unemotional essays,  $F(1, 51) = 78.13, p < 0.01$ ;  $F(1, 51) = 274.17, p < 0.01$ .

### Internal Reliability of Storyness Ratings

Our first hypothesis concerned the degree to which different types of writing samples could be reliably judged as good stories. The inter-rater reliabilities among the judges' ratings of story quality (based on the one item reflecting storyness) were consistent for all sets of essays: Cronbach  $\alpha = 0.84$  for essays describing an ambiguous drawing,  $\alpha = 0.92$  for essays describing an inkblot,  $\alpha = 0.79$  for the emotional essays, and 0.62 for the unemotional essays.

Because the correlation between the ratings of storyness for the essays based on the drawing and those based on the inkblot was strong,  $r(53) = 0.55, p < 0.01$ , these two ratings were averaged to create a composite index of picture-based story-making ability for each participant. Mean storyness scores were also computed for the emotional and non-emotional essays by averaging the four judges' ratings for each set. For all subsequent analyses, then, each participant had three composite storyness ratings based on the pictures, the emotional essays, and the non-emotional essays.

### Story-Making as an Individual Difference

Our second hypothesis concerned the degree to which story-making is a reliable individual difference variable. That is, to what degree are individuals consistent in their abilities to make good stories across different writing topics? The correlations among the ratings of storyness across topic were low and not statistically significant:  $r(50) = -0.06$  between emotional and picture essays,  $r(50) = -0.27$  between unemotional and picture essays, and  $r(52) = 0.11$  between emotional and unemotional

essays (all  $ps > 0.20$ ). In other words, surprisingly, we found no evidence that a person who writes a good story in one domain is also a good story-maker in another.

### Story-Making and other Judge-Rated Dimensions

Recall that judges rated the emotional and unemotional writings (but not the picture essays) along nine dimensions in addition to storyness. The inter-rater reliabilities for these dimensions were all above 0.60 for the emotional essays, except the 'growth' dimension. Ratings of these dimensions were less reliable for the unemotional essays, with 6 of them falling below 0.60 in inter-rater reliability: 'good read', 'mentally healthy', 'socially integrated', 'growth', 'same event', and 'insightful'. Taking only those dimensions with inter-rater reliabilities above 0.60, we used these ratings to see what factors correlated with or, perhaps, informed the judges in terms of perceptions of storyness.

As can be seen in Table I, certain dimensions characterized good stories for both emotional and unemotional topics. For example, authors of good stories were seen as mentally healthy ( $r \geq 30$ ,  $p \leq 0.05$ ), and taking the task seriously ( $r \geq 0.24$ ,  $p \leq 0.10$ ) (Table I). However, although having a moral message was highly correlated with storyness for the emotional essays ( $r = 0.55$ ,  $r < 0.01$ ), the opposite tended to be true for the unemotional essays ( $r = -0.24$ ,  $p = 0.10$ ). Thus certain dimensions seem to be general characteristics of all good stories, such as being sensible and serious, but other dimensions relate to storyness only if appropriate to the topic.

### Linguistic Variables

We found the use of linguistic dimensions previously thought to be indicative of good stories (positive emotion, negative emotion, causal, and insight words) to be only weakly associated with storyness ratings. As can be seen in Table II, emotional essays rated as good stories were (marginally) associated only with use of fewer positive emotion words ( $r = -0.25$ ,  $p = 0.10$ ) and good nonemotional stories were associated

TABLE I Correlations of ratings of story-making across the emotional and nonemotional writing topics with other judges ratings concerning the essays

	Story-making ratings	
	Emotional essays	Unemotional essays
Have a moral or message?	0.55**	-0.24#
A good read?	0.57**	n/a
Taken seriously?	0.63**	0.24#
Mentally healthy?	0.30*	0.38**
Socially integrated?	0.16	0.22
Shows change over 3 days?	0.53**	n/a
Wrote about same event?	0.61**	n/a
Insightful?	0.65**	n/a
Conflicted?	-0.15	-0.39**

Note: \*\* $p \leq 0.01$ , \* $p \leq 0.05$ , # $p \leq 0.10$  (two-tailed tests). n/a indicates that the item was not internally consistent,  $\alpha < 0.60$ .

TABLE II Correlations of ratings of story-making across three writing topics with LIWC dimensions

	<i>Picture topic</i>	<i>Emotional essays</i>	<i>Unemotional essays</i>
<i>Predicted LIWC Dimensions</i>			
Positive emotion	-0.30*	-0.25#	-0.46**
Negative emotion	0.21	-0.08	-0.45**
Causal word change (day3-day1)	n/a	0.15	-0.10
Insight change (day3-day1)	n/a	0.08	-0.15
<i>Other LIWC Variables</i>			
Word count	0.61**	0.37**	0.25#
Prepositions	0.16	0.26#	0.48**
Cause	-0.05	-0.01	-0.28*
Tentative	-0.40**	-0.02	-0.25#
See	-0.46**	-0.06	-0.05
Social	0.46**	0.01	0.16
Communication	0.43**	0.03	0.43**
Time	0.30*	0.13	0.06
Present	-0.36**	-0.15	-0.19
Motion	0.40**	0.04	0.32*
Leisure	0.18	0.11	0.39**
Home	0.20	0.20	0.38**

Note: \*\* $p \leq 0.01$ , \* $p \leq 0.05$ , # $p \leq 0.10$  (two-tailed tests).

with fewer positive and negative emotion words ( $r = -0.46$  and  $r = -0.45$ , respectively,  $p \leq 0.01$ ).

To determine if there were other LIWC patterns associated with good story-making, we selected a subset of the 72 LIWC dimensions using the following criteria: the base rate for the dimension across all three writing topics (picture topic, emotional topic, and unemotional topic) was at least 0.2% and minimally one of the three base rates was at least 1.0%. We also eliminated four LIWC dimensions that are not true language dimensions: words per sentence, question marks, unique words, and dictionary words.

From this winnowed pool of LIWC dimensions (12 total), we report those that are significantly correlated with storyness for at least one writing topic and do not fall in the opposite direction for the other two topics. The 12 LIWC dimensions, along with total word count, that met these criteria were prepositions, causal words, tentative words, sight words, social words, communication, time, present tense, motion, leisure, and home. As can be seen in Table II, only two of all LIWC dimensions are (nearly) statistically significant across all three topics (word count, which is positively correlated, and positive emotion, which is negatively correlated) suggesting that complexity and a lack of excitement (perhaps indicative of seriousness) are general features of good stories. The relationship between the other dimensions and storyness is dependent on the topic. For example, good stories within the picture topic are characterized by a high use of social, communication, motion, and time words, and a low use of tentative words and present tense. Communication, motion, leisure, and home words are important to good stories for the unemotional topic (recall that this topic focused on time management). In contrast, good emotional stories (which could address anything traumatic the participant wished to discuss) are linked to few concrete dimensions but instead focus almost exclusively on length and affect.



### Personality Variables

Given that story-making ability itself was not consistent across topic, it is not surprising that no personality variable was associated with good story-making across all topics. In fact, for two topics (picture and unemotional), story-making was not correlated with any personality variable we measured. The only significant correlations between personality variables and story-making ability were found in the emotional topic, where good stories were associated with agreeableness and good emotional intelligence (Table III). This is consistent with the high correlation between storyness and judges' ratings of good mental health.

### Health

For reasons not yet understood, only 13 of the 52 participants (25%) went to the student health center at all during the entire study period, a number far below the 65% who visit in the standard experiment. Given the extremely low base rate of physician visits, it is not surprising that no association was found between story-making and health as measured by several different indicators, including actual doctor visits reported to us by the student health center, self-reported doctor visits reported by our participants, and self-reported days of activity restricted due to illness. The correlation between story-making in the emotional essays and actual doctor visits in the month after these writings (controlling for baseline health) approached significance,  $r(52) = 0.26$ ,  $p = 0.07$ , but the relationship was not in the predicted direction (rather than better stories being associated with improved health, they were associated with poorer health). Story-making of unemotional essays was not related to actual doctor visits after writing,  $r(52) = -0.08$ ,  $p > 0.25$ .

The relationships among health and LIWC variables were also nonsignificant. Neither mean use of positive and negative emotion words nor changes in causal and insight words were related to doctor visits for the emotional essays:  $|r|(52) \leq 0.05$ ,  $p > 0.25$ , or for the unemotional essays:  $|r|(52) \leq 0.16$ ,  $p > 0.25$ .

TABLE III Correlations of ratings of story-making across three writing topics with personality measures

	<i>Story-making ratings</i>		
	<i>Picture topic</i>	<i>Emotional essays</i>	<i>Unemotional essays</i>
NEO-FFI: Neuroticism	-0.17	-0.01	0.06
NEO-FFI: Extraversion	0.18	0.15	0.03
NEO-FFI: Openness	0.14	0.18	-0.07
NEO-FFI: Agreeableness	-0.14	0.62**	0.09
NEO-FFI: Conscientiousness	-0.07	0.06	0.03
PEI: Repair	0.21	0.32*	0.14
PEI: Clarity	-0.04	0.04	0.02
PEI: Attention	0.04	0.27*	0.10
College Adjustment	0.14	-0.14	-0.13
Alexithymia	0.14	0.03	-0.13
Need for Cognition	0.02	0.04	0.12

Note: \*\* $p \leq 0.01$ , \* $p \leq 0.05$ , # $p \leq 0.10$  (two-tailed tests); PEI = Perceived Emotional Intelligence.

## DISCUSSION

Within the last decade, there has been an increasing interest in the role of narrative, or story-making, in the therapeutic process. The scientific premise (along with cultural wisdom), has been that story-making is healthy. Implicit in this belief is the assumption that we all know what a good story is. In actuality, however, little is known about the psychometric properties of story-making, such as whether it is a reliable individual difference variable or whether it can be assessed reliably by judges. Furthermore, the psychological correlates of story-making are unknown.

This present study examined the psychometrics of story-making and its relationship to the benefits of disclosure writing. Although we found that story-making can be reliably measured by independent raters (except for nonemotional topics), we also learned that story-making is not an individual difference that transcends writing topic. Rather than being a tendency that certain people bring to any writing situation, it appears that the situation determines the likelihood that a given person will write a good story. Some people wrote good stories when specifically asked to do so, others when writing about emotional topics, and still others when writing about unemotional topics. Furthermore, although it appears that patterns of linguistic use may be an individual difference variable (see Pennebaker and King, 1999), the present study suggests that surprisingly few of these factors are systematically related to the story-like quality of an essay.

Another assumption challenged by the results of this study is the idea that story-making is a predictor of good physical and mental health. Although story-making was related to judges' rating of mental health, there were no significant relationships between story-making and physical health. Nonetheless, it is possible that health benefits were difficult to discern because of the low base-rate of doctor visits across the study period and because there was a short time interval between writing tasks. Because of the time limits of a semester, we were only able to separate the writing periods by one month, leaving little time to observe the impact on participants' health. In addition, because people generally tend to get sicker later in the semester, it is possible that during the second writing, the participants were not in a state equivalent to that during the first writing. A more ideal procedure would be to conduct this study over two semesters and schedule each writing period near the beginning of each semester.

Despite these caveats, this study has succeeded in describing some of the psychometrics of story-making. Story-making can be reliably assessed by judges, but surprisingly it is not a consistent individual trait that transcends writing topic. Although there is a general topic-independent relationship between story-making and several LIWC dimensions, namely high word count and low positive emotion, surprisingly few LIWC dimensions are significant indicators of good stories. Thus our data did not confirm the hypothesis of previous researchers that good stories are associated with an increasing use of causal and insight words or a high level of emotion word use (Pennebaker, 1997; Pennebaker *et al.*, 1997; Pennebaker and Seagal, 1999). Personality traits are also relatively poor markers of story-making ability. Taken together, these results provide a warning that story-making is more complicated and less predictable than may be thought. Although the conventional wisdom that telling a good story is important in the therapeutic process is certainly appealing, further work is required to determine if in fact story-making is responsible for the health benefits of writing and whether there are linguistic patterns or markers of good stories.

### Acknowledgements

We are grateful to Anthony Cordaro, Annemarie Johnson, Leah Moore, Seema Vijayan and Hayley Warner for assistance with data collection and entry. The research reported in this paper was supported by a grant from the National Institute of Health (MH52391).

### References

- Bucci, W. (1995). The power of the narrative: a multiple code account. In: Pennebaker, J.W. (Ed.), *Emotion, Disclosure, and Health*, pp. 93–124. American Psychological Association, Washington, DC.
- Cacioppo, J.T. and Petty, R.E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, **42**, 116–131.
- Christensen, A.J. and Smith, T.W. (1993). Cynical hostility and cardiovascular reactivity during self-disclosure. *Psychosomatic Medicine*, **55**, 193–202.
- Costa, P.T. and McCrae, R.R. (1992). *NEO PI-R Professional Manual*. Psychological Assessment Resources, Odessa, FL.
- Gergen, K.J. and Gergen, M.M. (1997). Narratives of the self. In: Hinchman, L. and Hinchman, S. (Eds), *Memory, Identity, Community: The Idea of Narrative in the Human Sciences*, pp. 161–184. State University of New York Press, Albany, NY.
- Mahoney, M.J. (1995). Emotionality and health: lessons from and for psychotherapy. In: Pennebaker, J.W. (Ed.), *Emotion, Disclosure, and Health*, pp. 241–253. American Psychological Association, Washington, DC.
- McAdams, D.P. (1996). Narrating the self in adulthood. In: Birren, J.E. and Kenton, G.M. (Eds), *Aging and Biography: Explorations in Adult Development*, pp. 131–148. Springer, New York.
- Neimeyer, R.A. (1999). Narrative strategies in grief therapy. *Journal of Constructivist Psychology*, **12**, 65–85.
- Paez, D., Velasco, C. and Gonzalez, J.L. (1999). Expressive writing and the role of alexithymia as a dispositional deficit in self-disclosure and psychological health. *Journal of Personality and Social Psychology*, **77**, 630–641.
- Pennebaker, J.W. (1989). Confession, inhibition, and disease. In: Berkowitz, L. (Ed.), *Advances in Experimental Social Psychology*, Vol. 22, pp. 211–244. Academic Press, New York.
- Pennebaker, J.W. (1997). Writing about emotional experiences as a therapeutic process. *Psychological Science*, **8**, 162–166.
- Pennebaker, J.W., Colder, M. and Sharp, L.K. (1990). Accelerating the coping process. *Journal of Personality and Social Psychology*, **58**, 528–537.
- Pennebaker, J.W. and Francis, M.E. (1996). Cognitive, emotional, and language processes in disclosure. *Cognition and Emotion*, **10**, 601–626.
- Pennebaker, J.W. and Francis, M.E. (1999). *Linguistic Inquiry and Word Count (LIWC): A Computerized Text Analysis Program*. Erlbaum Publishers, Mahwah, NJ.
- Pennebaker, J.W. and King, L.A. (1999). Linguistic styles: language use as an individual difference. *Journal of Personality and Social Psychology*, **77**, 1296–1312.
- Pennebaker, J.W., Mayne, T.J. and Francis, M.E. (1997). Linguistic predictors of adaptive bereavement. *Journal of Personality and Social Psychology*, **72**, 863–871.
- Pennebaker, J.W. and Seagal, J.D. (1999). Forming a story: the health benefits of narrative. *Journal of Clinical Psychology*, **55**, 1243–1254.
- Salovey, P., Mayer, J.D., Goldman, S.L., Turvey, C. and Palfai, T.P. (1995). Emotional attention, clarity, and repair: exploring emotional intelligence using the trait meta-mood scale. In: Pennebaker, J.W. (Ed.), *Emotion, Disclosure, and Health*, pp. 125–154. American Psychological Society, Washington DC.
- Smyth, J.M. (1998). Written emotional expression: effect sizes, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*, **66**, 174–184.
- Smyth, J.M., True, N. and Souto, J. (2001). Effects of writing about traumatic experiences: the necessity for narrative structuring. *Journal of Social and Clinical Psychology*, **20**, 161–172.
- Taylor, G.J., Ryan, D. and Bagby, R.M. (1985). Toward the development of a new self-report measure of alexithymia. *Psychotherapy and Psychosomatics*, **44**, 191–199.