

**Parallel Session 8: The role of books and literature in public  
communication of science**

**FACT VIA FICTION  
STORIES THAT COMMUNICATE SCIENCE**

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**Abstract**

In this research I propose that narratives represent an alternative means to communicate scientific ideas to society. In a previous study (presented in Cape Town, South Africa 2002 PCST-7), I obtained information about the effect of factual and narrative formats on people's memory and learning. In order to achieve a better understanding of the differences between these two kinds of written information, it was necessary to extend the study both in sample size and in time scale. In this paper I report the results of a follow-up study. The results suggest that, for science communication concerns, both text forms can be considered equally effective in conveying scientific knowledge.

**Key Words:** Science, Communication and Narratives

**Text**

Introduction

A fundamental task for science communication is to produce materials that are not only understood by the general public, but also remembered in the long-term as a part of the learning process. There is evidence from memory studies suggesting that narratives represent a good recall device and a learning aid (Sternberg, 2003).

Here I will suggest that literature is an alternative and effective media to teach science as Gough (1993), Appelbaum (1995) and Weaver (1999) propose. In a broader sense, those narratives represent an important means for science communication to transmit and recreate information in an accurate, memorable and enjoyable way.

In a previous study, I obtained information about the effect of factual and narrative formats on people's memory and learning (two measures in time), as well as about the way people organise information when retelling stories (Negrete, 2002 and Negrete, 2003). In order to achieve a better understanding of the differences between factual and narrative formats, it was necessary to extend the study both in sample size and in time scale. In this paper I report the results of a follow up study that I carried out with a larger sample and a third measure in time.

Objectives

To evaluate the ability of fictional narratives (short stories) in communicating scientific ideas.

To investigate the extent to which people can understand, apply and remember scientific knowledge included in a short story in comparison to traditional factual texts.

### Methods

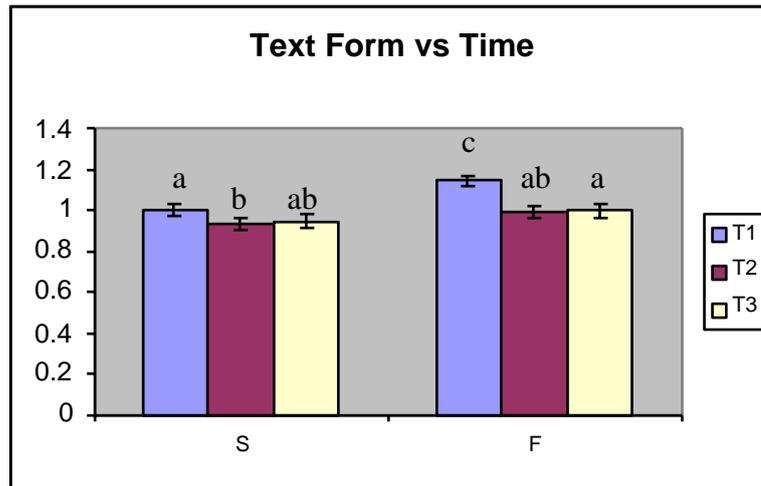
Two stories with scientific content (Nitrogen by Primo Levi, and The Crabs Take Over The Island by Anatoly Dnieprov) were adapted (1500 words each) to enable the participants to read them and complete two questionnaires about them in an hour session. The study included a contrast between factual and narrative scientific information and compared the extent to which the information was remembered at three different times (immediately after reading, two weeks and a month later). A group of 52 undergraduate students participated in the test.

In the creation of this study, four forms of question were included: multiple choice (identify), straightforward and open-ended questions (remember), questions to recount the stories or the lists of facts (retell), and questions where the participant was expected to produce a solution for a particular problem mentioned in a hypothetical situation (contextualise). A combination of measurements of explicit and implicit memory provided a learning measure and therefore an estimator of science communication success.

In order to perform a comparison between factual and narrative information, I extracted from each story a list of all the scientific facts mentioned. In this way all the scientific information included in it was transformed to individual sentences that mention these facts in a plain textbook style and isolated from the story (the extreme opposite of narrative form). Questionnaires were applied to assess the scientific information remember and understood. A statistical test was carried out to compare the performance of the two groups (rm-ANOVA).

### Results and Discussion

Particularly relevant for this study was that the interaction between Time (session 1,2 and 3) and Text Form (narrative and factual) was significant ( $f=5.67$ ;  $p<0.002$ ). The effect of Time is different depending on the Text Form. T1 and T3 in the narrative group are not statistically different to T3 in the factual group. T2 in the narrative group is not statistically different from T2 in the factual group and that T2 and T3 in factual group are not statistically different. This indicated that performance on T1 for the factual group was better than in the narrative group but in T2 and T3 there were no statistical differences in performance between groups (Figure 1).



**Figure 1.** Differences in performance between narrative (S) and factual (F) groups over time (T1, T2 and T3). Different letters indicate significant differences (HSD  $p < 0.05$ ).

This study suggested that, independently of the memory task, factual information is better remembered immediately after a reading compared to narrative one. However, as time goes by, there is no statistical difference in the amount of scientific information retained. Consequently, it is possible to conclude that, in the long term, both text forms are equally effective in conveying scientific knowledge.

The results also suggest that factual information deteriorates at a faster rate than the narrative format. It is plausible that differences are due to the fact that narrative information provides numerous aids for storing and retrieving information from memory. It therefore prevails longer than information that does not include mnemonic devices.

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