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CARTOONS AND VISUAL TEXTS IN PROMOTING TEXT COMPREHENSION

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ABSTRACT. The research focuses on text comprehension and presents an experimental training aimed at fostering inferential skills. In particular, it explores the possibility of using visual material to develop comprehension skills for preschool children, because studies demonstrated that comprehension of visual and verbal texts require the activation of common cognitive processes (Kendeou et al., 2005). The research involved 54, 5 year old children, divided into 3 groups: one control group. In the other 2 experimental groups, the same experimental curriculum with visual texts was implemented, consisting of 9 sessions during children explored, read and discussed 9 different texts. In one experimental group, the intervention was individualized; in the other it took place in a small group situation. Before and after the experiment, the following abilities were tested: the ability to comprehend an oral text (including inferential skills), and inferential skills in reading of iconic texts (images and cartoons). The results obtained by statistical analysis indicate the effectiveness of the experimental training in fostering oral text comprehension. In particular, the individualized intervention was more productive for children with average initial comprehension ability. Conversely the training in small group determined the greatest improvements among children with low initial skills.

RESUMEN. La investigación se concentra en la comprensión de textos y presenta una formación experimental dirigida a potenciar las habilidades deductivas. En particular, explora la posibilidad de utilizar materiales visuales para desarrollar las habilidades de comprensión en niños de preescolar, porque la comprensión de textos visuales y verbales requiere la activación de procesos cognitivos comunes. En la investigación han participado 54 niños (5 años), divididos en tres grupos, uno de control. En los dos grupos de estudio, se aplicó el mismo plan de estudios experimental, que consistía en nueve sesiones durante las cuales los niños exploraban, leían y comentaban textos visuales diferentes. En un grupo de estudio la intervención fue individualizada, mientras que el otro se desarrolló en grupos pequeños. Antes y después del experimento se pusieron a prueba las siguientes habilidades: la comprensión de un texto oral y

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las capacidades deductivas al leer textos visuales. Los resultados señalan la eficacia de la formación experimental para fomentar la comprensión de textos orales. En particular, la intervención individualizada fue más productiva con niños cuya capacidad de comprensión inicial estaba en la media. Por contra, la formación en grupos pequeños obtuvo los mejores resultados con niños con bajas capacidades iniciales.

Introduction

The recognition of the clear link between school performance and the ability to understand texts and the results of some international research have highlighted the difficulty of many students in understanding what they read (OECD-PISA, 2012). This is the starting point for this research work.

Other decisive studies for this research have considered the correlation between the understanding of verbal and visual texts, demonstrating how the comprehension of texts conveyed by different media involves the same set of cognitive operations (Bertolini, 2012; Kendeou et al., 2005; Paris, 2003). Recognition of signs, categorisation, continuous integration (inference) are common operations which are necessary for the comprehension of visual and verbal texts (Cardarello, 2009; Lumbelli, 2009). A great deal of research has found that the comprehension process depends largely on the reader's ability in drawing inferences (Oakhill & Cain, 2012). Such skills, which appear problematic in school learning years (OECD-PISA, 2012), are already active during early childhood (Kendeou et al., 2005), when required particularly for interpreting lifelike and figurative drawn images (Bertolini, 2012).

Based on these elements, this research aims to verify whether stimulation of comprehension focused on visual material also increases the understanding of verbal texts. Specifically it aims on one hand to verify the effectiveness of visual materials for this task, and on the other to compare the efficacy of the experimentation when performed with individual treatment and in small groups treatment.

Method

Participants

The research involved 54 5-year olds attending the last year of Italian preschool (in Reggio Emilia).

The research design is quasi-experimental, with 3 classes. In particulary, based on the scores in the initial oral text comprehension tests, two nearly equivalent groups were established: a control group (CG, 18 children) and an experimental group (EG, 36 children).

The experimental group was in turn split into two nearly equivalent sub-groups, and the same stimulus was used with both sub-groups. In the IEG (individual experimental group, of 18) the work was done one-to-one (1 adult and 1 child). In the CEG (collective experimental group, of 18) the work was done in small groups (1 adult and 3 children).

Design

The efficacy of the experimental training was controlled with an oral standardized comprehension test for Italian children (TOR by Levorato & Roch, 2007) for all children, before and after the training (pre-test and post-test). All tests were administered individually. The purpose of tests was to measure text comprehension, in

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particularly inferential skills. Specifically, the test ask children to listen two stories read by an adult and to answer multiple choice questions (textual and inferential).

All children took part in 9 sessions. In the control group (CG), the adult performed activities which were not beyond the sphere of language but which did not specifically aim to foster understanding: the adult read 9 books without explaining the difficult passages and without asking the children any questions.

In the two experimental groups, 9 sessions where held to stimulate inferential skills, where all the children worked with the same 9 different visual materials. 9 sessions where held individually (IEG), the others in small groups (CEG).

Materials

The experimental work used 3 different types of visual texts: only images, sequences of images and cartoons. These were static or moving images, lifelike or figurative, taken from children's literature or series of cartoons, selected for the required integration activities.

The single images portrayed several characters in the same scene, busy with a range of different activities. The sequences told a short story through a succession of 4 to 6 coloured or black and white images. The cartoons, lasting around 3 minutes each, told the story of some characters communicating with each other through movements, expressions or sounds that were not traceable to any specific language (e.g. Plonsters or Uki).

Figure 1 shows an example of a sequence of images which, when correctly read, tell the story: "As Tommy carries the pasta to the table, he slips on some marbles and falls over". This comprehension process demands a series of additional activities which allow us to offer global meaning to the text starting from the individual images, recognising the time frame and causal links and inferring that an event happened (falling over) which is not represented.

Figure 1. Example of the sequence used in the experiment, taken from Lastrego, C., Testa, F. (1986). *Tommasone resta in città.*Trieste: E. L.

Procedure

In each experimental session, the children were invited (individually or in small groups) to observe/*read* a visual text (a different one used in each session, but the same for all children) and describe it verbally, interacting with the adult and the classmates (in small groups only).

In particular, the adult introduced the task with an open question: *"What can we see? What is happening?".* The adult then supported the children's participation and communication using the reflective listening technique (Lumbelli, 1982; Rogers, 1951).

The adult focused on the passages of the text requiring the children to process inferences and, when faced with incorrect inferences, invited the children to formulate alternative interpretations, such as: "*Perhaps Tommy fell over because Bobby played a trick on him [thus accepting the child's incorrect answer], could he have fallen over for*

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a different reason?" (Cardarello, 2009). Finally, the adult stimulated metacognition using questions like *"What did you see that made you think that …".*

Based on this experimental pattern used by the adult in both experimental sub-groups, in the IEG single sessions the adult focused on the thoughts of each child and stimulated the discussion in specifically tailored manner. In the CEG, the adult supported the discussion in small groups (of 3 children), fostering joint processes of text comprehension.

Results

The efficacy of the visual materials for fostering verbal oral comprehension was verified by comparing the scores obtained in the oral comprehensions tests by the control group (CG) and the experimental group (EG) as a whole (IEG +CEG). Table 1 shows the average trends of the TOR scores.

Table 1. *Average scores obtained in the TOR in the control group and experimental group*

	Initial TOR	Final TOR	Increase
CG (18)	9.04	10.32	+1.28
EG (36)	9.16	11.85	+2.69

First of all, we controlled the effect size (experimental/control). It resulted 1.13. It meant that the increase of the TOR scores in the experimental group was higher than the increase in the control group.

Then, the efficacy was controlled using a repeated measures ANOVA with 3 factors of analysis: the time, the group and the level of performance on initial TOR (low, medium, high).

The analysis showed an interaction close to the significance threshold between time, the group and the initial level of performance ($F = 2.51$; $p = 0.093$). We think that the small samples could be one of causes of difficult of ANOVA to recognize statistical significant difference.

In the EG, post-test all children showed an improvement in performance, although the greatest improvements were seen in children with lower initial levels. In contrast, in the CG the children with average level of performance showed a worsening in the final test.

Subsequently, we compared the control group (CG) and the two experimental groups (IEG and CEG) in order to check the effect of the setting.
Table 2 shows the average trends of the TOR scores.

Table 2. *Description of the average scores obtained in the TOR in the control group and experimental group*

	Initial TOR	Final TOR	Increase
CG (18)	9.04	10.32	+1.28
IEG (18)	9.25	12.08	+2.83
CEG (18)	8.91	12.30	+3.39

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The ANOVA highlighted a significant interaction between time, the group and the initial level of performance (F = 2.71; p = 0.043.): the CEG showed the greatest increases between children with greater comprehension difficulties at pre-test (low level), while the IEG among children with medium initial levels of performance.

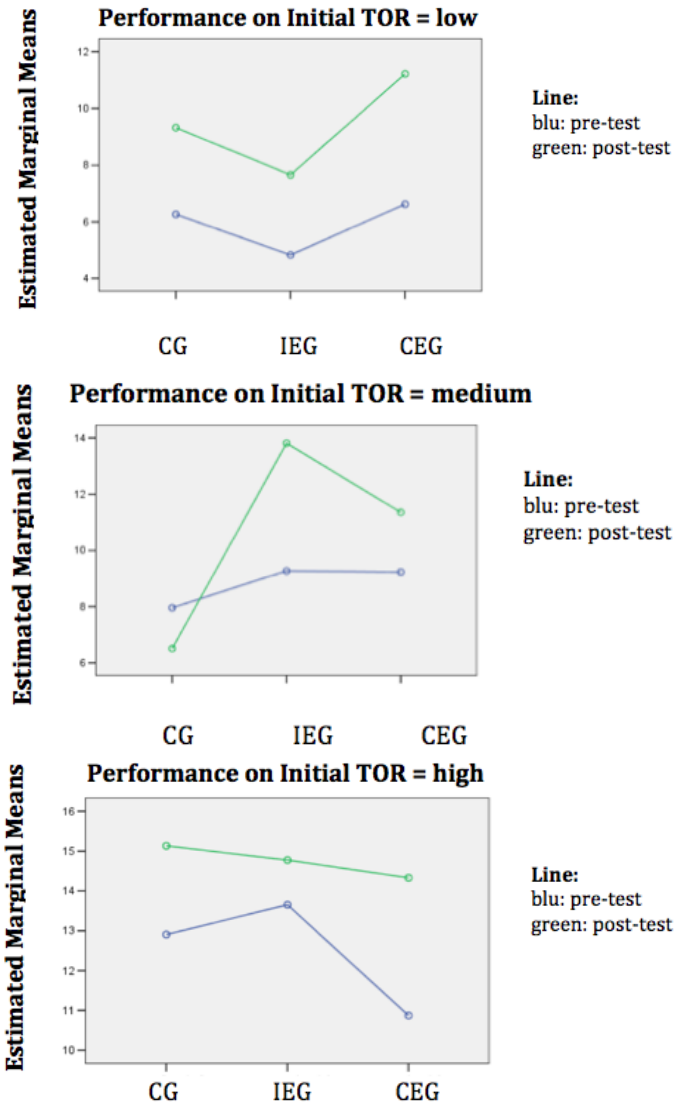

Figure 2. Graphs showed the interaction between time (pre and post-test), the group (CG, IEG and CEG) and the initial level on TOR performance (low, medium and high).

Finally, we compared the scores only between IEG and CEG using a repeated meseaures ANOVA. The test didn't detect significant difference.

Conclusions

We think that the results obtained are significant for teaching research for several reasons.

On one hand, they confirm the possibility to stimulate verbal text comprehension skills through activities focusing on inferantial skill during the reading of solely visual materials, which are fun and enjoyed by the children. On the other hand, they underline

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the possibility to foster comprehension through small group discussions: this setting is more "sustainable" and replicable in schools than individual work. Finally, they indicate that it is possible to stimulate comprehension skills with a view to prevention: working with preschool age children who have not yet learned to read.

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