

Comprehension and memory of texts: the interpretation of the title effect

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1. THEORETICAL CONSIDERATIONS

Text memory can't be reduced to the storage of its elements or its structure. It depends on what subjects have understood. There are three levels of text comprehension: the structural level, the macrostructural level and the situation level (van Dijk & Kintsch, 1983). This model predicts an effect of the title on these three levels. But there are two opposite explanations: the cognitivist and the connexionist interpretation.

Cognitivist perspective predicts an effect of the title on coherence of the text. Before subject reads the text, the title gives him some macrostructural information and activates cognitive schemata which facilitate the integration of textual information. Title either gives complementary information or topic information. When title gives complementary information, it turns the comprehension onto particular representation and limits text ambiguity. When title gives a topic information, it activates schemata or script facilitate the construction of text representation by integrating text sentences and bridging and elaborative inferences. Bridging inferences participate to the coherence of the textbase; elaborative inferences link together text information and subject's knowledge and participate to the coherence of the situation model of the text. In fact, the cognitivist perspective predicts only an effect of the title when it appears before the text.

In the opposite, the connexionist perspective gives a large place to input. The subject constructs a textbase formed by textual propositions, paraphrases, cotextual and contextual information, local, global and elaborative inferences, etc. Then an integrative process strengthens the relevant propositions and inhibits the irrelevant. Eventually, a meaning emerges automatically among the various constructions elaborated. This meaning is contextually and specific to the situation. That is why a meaning is always a situation model elaborated from text information and subject's knowledge. In the connexionist approach, the effect of title is not only expected when it appears before the text, an effect is also expected when the title appears after the text. Title confirms or not the emergent meaning.

So the effect of the title presentation (before and after) is not the same if we adopt the cognitivist or the connexionist interpretation. Cognitivism predicts facilitator effect only when title is before the text, while connexionism admits an effect when title is after the text.

TABLE I: Characteristics of elders

	Alzheimer patients		Elders		Differences
Age	mini = 72 maxi = 89	82 $\sigma = 5.01$	mini = 73 maxi = 93	82 $\sigma = 3.4$	t = .24 p : NS
MMSE (1)	mini = 11 maxi = 23	16.87 $\sigma = 3.59$	mini = 25 maxi = 30	27.75 $\sigma = 1.42$	t = 13.48 p < .0001

(1) Mini Mental State Examination: a practical method for grading the cognitive state (Folstein & McHugh, 1975).

2. Experiment

2.1. Subjects:

In order to test these two interpretation, we presented the results of four groups of subjects: children (10 years old), 36 young people (20 years old), elders (80 years old) and Alzheimer elders (80 years old).

2.2. Material

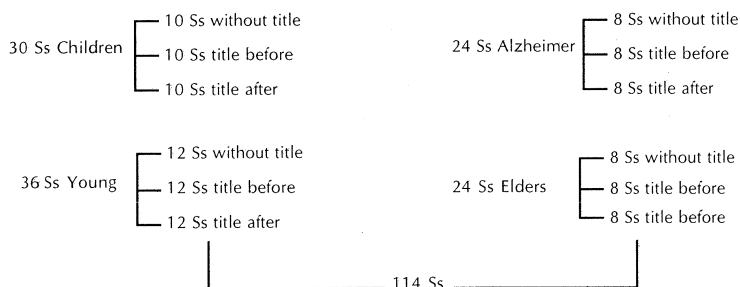
For each group, we selected narrative text about 150 words easy to learn. We tested the difficulty of the text with no-experimental groups of adults who have the same average age.

Text memory is evaluated using a recognition task to test the effect of the title on different level of comprehension: surface structure, textbase and situation model. We used Kintsch, Welsch, Schmalhofer & Zimny's paradigm (1990) :

- *original sentences* : surface structure, textbase and situation model are not modified.
- *paraphrases*: involved minimal word order or single word changes, they are identical with the original text at the levels of their textbase and situation model but differ in their surface structure.
- *bridging inferences* : textbase and situation model are not modified.
- *elaborative inferences* : situation model only is not modified.
- *no-contextual and no-inferable sentences*: these sentences served as the baseline for the recognition analysis as distractor.

For each group of subjects the text are read twice. Subject were instructed to listen the text and to answer at a recognition task.

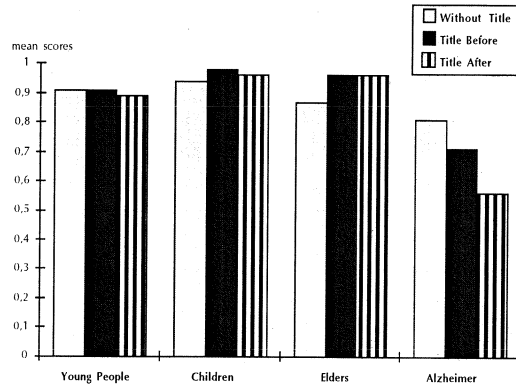
2.3. Design



3. RESULTS

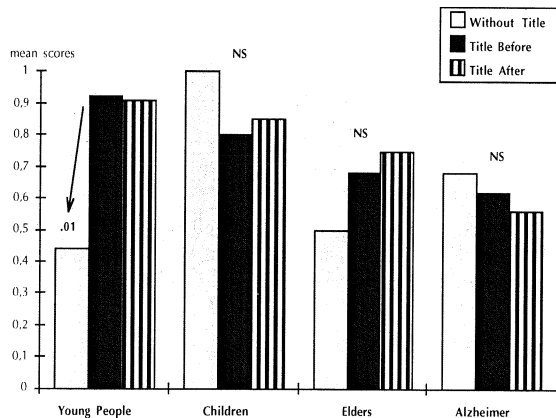
First we must say that the no-contextual and no-inferable sentences are majority rejected. Next figures show the average scores of recognition to original sentences, paraphrase, bridging inferences and elaborative inferences.

Fig. 1: Average scores of Yes responses for original sentences



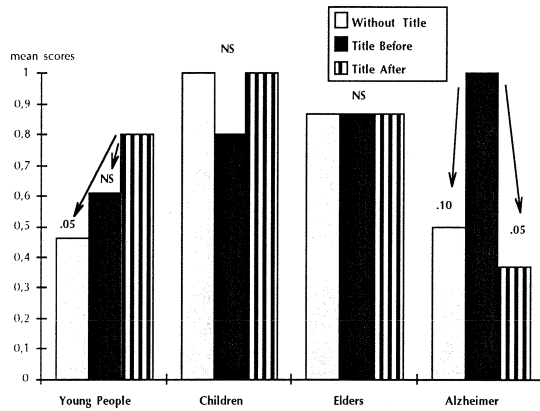
- In any group, no significative difference in performance was observed according to the presence and place of the title.

Fig. 2: Average scores of Yes responses for paraphrases



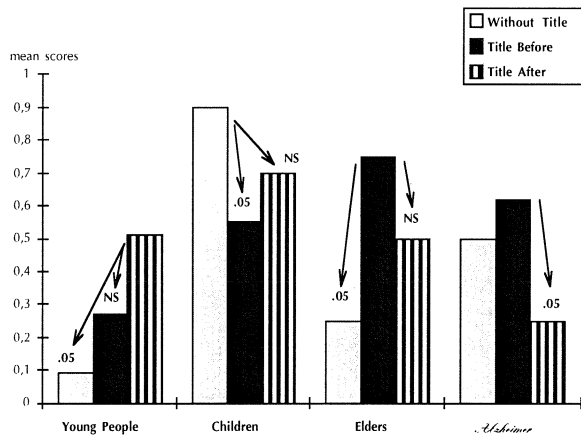
- In the young people group, recognition for paraphrases was better when title is present (before and after) than when it is absent.
- In the other groups, no difference in performance was observed according to the presence and place of the title.

Fig. 3 : Average scores of Yes responses for bridging inferences



- In the young people group, recognition for bridging inferences was better when title was presented after the text than when it was absent.
- In the Alzheimer group, recognition scores were higher when title was presented before the than when it was presented after or absent.
- In the other groups, no difference in performance was observed according to the place of the title.

Fig. 4 : Average scores of Yes responses for elaborative inferences



- In the young people group, recognition scores were higher when the title was presented after than before.
- In the children group, recognition for elaborative inferences was better when title was absent or after the text than before.
- In the elders group, recognition scores were higher when title was present than absent, whatever its place may be.
- In the Alzheimer patients group, recognition scores were higher when title was absent or before the text than when after.

4. CONCLUSION

The cognitivist approach predicts an effect of the title only when it appears before the text. However, our results don't support this prediction : an effect of the title is observed whatever its place may be. The results of children, young adults and elders are consistent with the connexionist perspective : the title effect is observed as well when the title precedes the text as when it follows the text. Title effects leads subjects to a higher recognition of bridging and elaborative inferences: it suggests that local coherence is more explicit and that situation model is more elaborated. There is no significant effect of the place of the title on these results, but we note in young adults group, that recognition scores tend to be higher when title is after than when it is before the text. It seems that the presentation of the title after the text leads to a new activation of the propositional network that increases the availability to these inferences.

In the Alzheimer patients group, data are only consistent with the cognitivist perspective. When subjects have some memory difficulties, title seems to be able to activate schemata information but doesn't seem to be able to confirm emergent meaning (Brouillet & Syssau, 1997).

This last result leads us to think that title effects could be explain by the two perspective: cognitivist and connexionist. So title could have two functions: activates schemata information and confirms the emergent meaning of the text.

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