Prior knowledge and Hypertexts Structure:
a Combined Effect of a Well-Organized Structure and a Coherent Pathway on
Comprehension for Novices

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We investigated the interaction effect between the level of prior knowledge and the
type of structure on comprehension with a hypertext device (i.e. parts of text related by links
thanks to a conceptual map). 55 psychology students (undergraduates) studied a lesson
dealing with the infectiousness process of a virus. Three structures of a conceptual map were
compared: a network providing no guidance, a linear structure that provided guidance hinting
a coherent pathway (i.e. respecting the temporal-causal structure of the infectiousness
process), and a hierarchical structure that provided a “well-organized” structure of the content
and guidance for a coherent pathway. Comprehension was assessed with text based questions
(the answer was explicitly mentioned into a node) and with inferential questions for the
situation model (to answer the learner needs to infer the relationships between two or more
distinctive nodes). Two types of information were distinguished: the anatomic information
(spatial information about the cell and the virus) and the functional information (causal and
temporal information about the infectiousness process). On the basis of the Construction-
Integration model of Kintsch (1988)², we hypothesised that the hierarchical structure
combined with a coherent pathway would support the situation model scores of the novices
and that experts would benefit from no particular type of structure.

The results showed an interaction effect only for the anatomic information for both
text based questions and inferential questions. As expected, the hierarchical structure entailed
higher scores for the low knowledgeable learners than the linear structure and the network
structure. For the high knowledgeable learners, the linear structure supported the higher
results than the network and the hierarchical structure. Thus, the structures effects were
similar on both the text base scores and situation model scores suggesting that the two levels
of text representation may be related and evolve together. Moreover, added analyses indicated
that novices following a coherent pathway during a second reading of the content in the
hierarchical structure obtained higher scores for the functional information. However, the high
knowledge learners benefited from a low coherent pathway during a first reading for the
anatomical information.

Our findings support partly previous results obtained by Salmeron, Cañas, Kintsch and
Fajardo (2005)³ and suggest that: (a) a coherent pathway seems to improve the text base and
the situation model for the lower knowledgeable learners, but (b) it seems to favour
comprehension only during a second or more reading of the nodes.

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model. Psychological Review, 95(2), 163-182.