

An ACT-R Model on the Influence of Spreading Activation on Memory Retrieval in a Sequential Diagnostic Reasoning Task

Udo Böhm

In diagnostic reasoning the reasoner needs to integrate sequentially incoming information into a coherent mental model of the situation and retrieve task relevant information from long-term memory. Working memory has been proposed to play a crucial role in this task. However, the processes involved in memory retrieval have not yet been fully understood. Different factors of influence such as time since the information became available (Wang et al., 2006) or the amount of information in working memory (Lovett et al., 2000) have been suggested. To test these assumptions, four ACT-R models were developed that incorporate different spreading activation mechanisms. The models' performance was compared to human data on a sequential diagnostic reasoning task. Moreover, the original models were re-implemented with varying parameter settings to explore the models' generalizability. The results show that the proposed factors do not necessarily influence memory retrieval. Rather, it seems that each piece of information has the same potential to activate associated information in memory.