Reading Instructions in ACT-R: When Word Order Matters

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Dixon (1987) discusses an experiment in which participants read simple instructions such as "To obtain the picture of a house, draw a rectangle with a triangle on top". He found that participants' performance depended on the sentence structure that was used for the instructions. Thus, subjects were slower to read "Draw a rectangle with a triangle on top to obtain the picture of a house" than the original instruction; their performance was also poorer. We attempted to replicate Dixon's experiment in a different context: that of an editing task. Our participants studied text editing commands specific to an Emacs-like text editor and then saw instructions such as "To delete the rest of the line press keys 'a' and 'd'". The results showed no dependence of either reading or executing times on the sentence structure of the instruction. We present an ACT-R model that captures latencies for reading the instructions in both Dixon's and our text editing experiment. This model is based on our sentence processing model INP. We argue that the difference between Dixon's result and ours is in the background knowledge organization: in Dixon's study the knowledge involved in performing the task is more familiar and organized in script-like structures, whereas no such structures were formed for the text-editing experiment.