Maintaining, retrieving, and reorganizing information in working memory: Modeling performance of the letter-number sequencing task

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Abstract: Working memory capacity involves both the ability to maintain information in the face of interference and the ability to make controlled use of long-term memory. Individuals with greater working memory capacities are able to keep more information active and are better able to search memory for additional information (Unsworth & Engle, 2007). The present research examines the contributions of both maintenance and controlled retrieval in task performance by implementing these processes in a computational model of working and long-term memory. Specifically, this model was tested on data from the letter-number sequencing (LNS) task. The LNS task requires maintenance, retrieval, and reorganization of information and is commonly used to assess working memory. The task has individuals remember and re-order strings of letters and numbers. Normally only the total score on this task is reported. However, the pattern of omissions, intrusions, and reaction times proved informative for testing working memory models.