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Abstract

Expertise in a given domain is generally regarded as being manifested in the possession of a large body of knowledge stored as chunks or schema in long-term memory. Recall experiments in a variety of domains have demonstrated that experts possess larger chunks of knowledge on meaningful tasks, while their performance falls to that of novices on non-meaningful tasks. Three experiments are reported, two recall and one construction, that were designed to provide information on programmers' (COBOL) knowledge structures. In the initial experiment, the chunking ability of computer programmers, as revealed by program recall, was less successful in predicting performance on a debugging task than were programmers' problem-solving processes. A second experiment sought to determine whether the lack of a match between programmers' chunks and the information structures in the program used for recall was

responsible for the poor differentiation of programming skill afforded by the recall test. Although expert programmers recalled more than novice programmers, there were no qualitative differences in the types of structures the two groups recalled. A third experiment required expert programmers to construct a routine to accomplish a similar function to that of the program used for recall. The programmers constructed routines with diverse program structures. In general, the results show that both expert and novice programmers possess a wide variety of chunks of the kind incorporated into the recall program. It appears, however, that even professional programmers do not have well-formulated scripts for validation stored in long-term memory.

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