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Curtis, B.;
A Review of Human Factors Research on Programming Languages
and Specifications;
Human Factors in Computer Systems, (1982), pp. 212-218.

This paper presents a partial review of work on human factors in computer programming in the period from 1974 to 1981, focusing on cognitive models of programmer problem solving and experimental research on language characteristics and specification formats.

In the paper, Curtis identifies four main areas relevant to developing a psychological understanding of programming: cognitive ergonomics, cognitive psychology, psycholinguistics, and industrial/organizational psychology. Research in these fields can potentially contribute to each phase of the software life cycle.

Curtis reached the following conclusions on the three aspects on programming that were surveyed:

1. Models of problem solving in programming

The limitations of human memory provide severe constraints for programmers. The limits of short term memory are overcome by chunking information at increasingly higher levels of abstraction. As programmers structure their knowledge through the chunking of programming concepts, their understanding of programming changes qualitatively. Expert programmers show a greater consensus in the structure of their knowledge than do novices, and are able to more effectively retrieve and integrate the chunks that constitute this structure in solving problems.