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## Initial skill learning: an analysis of how elaborations facilitate the three components

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### 1. INTRODUCTION: SKILL LEARNING AND THEORIES OF COGNITION

Understanding the processes by which people learn is fundamental to any theory of cognition. Accounting for learning adds constraints to theories of cognition; not only must a theory account for adult capacities, but it must also posit mechanisms for acquiring new capabilities as adult learners do. Although the study of how information is acquired has been central in memory research, only a few theories of cognition, problem-solving and the like (e.g. Anderson, 1983; Kieras and Polson, 1985; Hayes and Simon, 1974) have been concerned with specifying how a skill or procedure is initially acquired.

It seems natural and desirable to try to apply what we have discovered about acquiring factual information to the study of how people learn new skills or procedures. However, while the findings from the memory domain are certainly relevant to the study of skill acquisition, they fall short of what is needed. At the very least, the standard performance measures for fact learning (e.g. recognition judgments, binary-choice decision tasks and recall protocols) are inappropriate for measuring skill learning, which requires the learner to *apply* his or her knowledge. Consider a budding scientist who has studied inferential statistics in order to determine the reliability of experimental results. A fair test of how well this student has learned the various statistical tests is not whether she can recall their formulae, but rather whether she can select the appropriate test and use it correctly to analyze the data.