INFORMATION PROCESSING AND MEMORY

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1. Introduction

EPAM (Elementary Perceiver and Memorizer) is one of a class of computer simulation models of cognitive processes that have been developed in the last decade. These are models of human information processing in certain learning and problem solving tasks. This paper is not the place to survey this literature. The reader who wishes to become acquainted with a wide variety of research projects in this area is advised to seek out the book *Computers and Thought* [4].

The presentation of this paper at the Berkeley Symposium on Mathematical Statistics and Probability involves a paradox. Neither my work nor the work of my colleagues in the area of simulation of human cognitive processes has much to do with either probability or statistics. The bulk of these models is deterministic, not stochastic. Usually one even searches in vain for a single Monte Carlo procedure in the computer simulation programs that we write. Nevertheless, I will proceed with my story, the paradox remaining unresolved.

In this paper I shall first sketch briefly the history of the EPAM project, without which the remainder of the discussion is not very meaningful. Next, I will attempt to reinterpret the EPAM theory in terms of an emerging three level theory of human memory. In the remainder of the paper, I would like to explore some questions relating to a theory of human long-term associative memory.

1.1. *A brief history of the EPAM project.* Work on the various EPAM models began almost ten years ago. The research has always been a joint effort by myself and Professor Herbert A. Simon of Carnegie Institute of Technology. We have been concerned with modeling the information processes and structures which underlie behavior in a wide variety of verbal learning tasks. These include the standard serial and paired-associate learning tasks, and other not so standard verbal learning tasks.

EPAM I was a very simple model, so simple, in fact, that a mathematical formulation, as well as a computer simulation, was constructed. In EPAM I,

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