

tions. Note that the model is not accurate for all calculators, since some require only one press of the clear button to clear all registers.

Schema-Based Processing

How do schemata or mental models function to influence information processing? At the least, schema theory must deal with how schemata and mental models are acquired in the first place, how they are elaborated and modified through experience, and how they are selected and used in a processing task. Let us first consider selecting and using schemata in the face of various tasks.

Comprehending Text. Rumelhart (1980) described how readers construct interpretations of the following brief passage:

Business had been slow since the oil crisis. Nobody seemed to want anything really elegant anymore. Suddenly the door opened and a well-dressed man entered the showroom floor. John put on his friendliest and most sincere expression and walked toward the man. (p. 43)

Sentence by sentence readers appear to invoke and evaluate schemata for their relevance to the story and ability to account for the available facts. So, for example, a business schema is selected with the first sentence, which suggests hypotheses about what is being sold. Encountering the word *elegant* in the second sentence causes readers to modify their interpretation; perhaps people do not want to buy large, elegant cars. *Showroom* is consistent with the car-selling schema, so that *well-dressed* signals money and buyer schemata, and so on. You can see the interaction between bottom-up and top-down processing that occurs in schema theory accounts of processing. An incoming stimulus activates a schema (bottom-up), which, by virtue of its variables, sets up expectations (top-down) for additional information as to the values of these variables. To the extent these expectations are met, that schema is instantiated. Information contrary to expectation, however, leads to alternate schema activation or modification of the current schema.

Comprehending lengthy texts is likely to involve not only activating and instantiating specific schemata, but also organizing those schemata into complex mental models. Johnson-Laird (1983) used the following illustration to demonstrate. Excerpted from Arthur Conan Doyle's (1905) story, "The Adventure of Charles Augustus Milverton," is this account of how Sherlock Holmes and Dr. Watson set out to burgle the house of a blackmailer, "the worst man in London."

With our black silk face-coverings, which turned us into two of the most truculent figures in London, we stole up to the silent, gloomy house. A sort of tiled veranda extended along one side of it, lined by several windows and two doors.