

Figure 3-3. Extent of age-associated memory impairments (AAMI) in two studies

Baseline age-related declines
in short-term memory

memory stores
+
memory processes
are
related

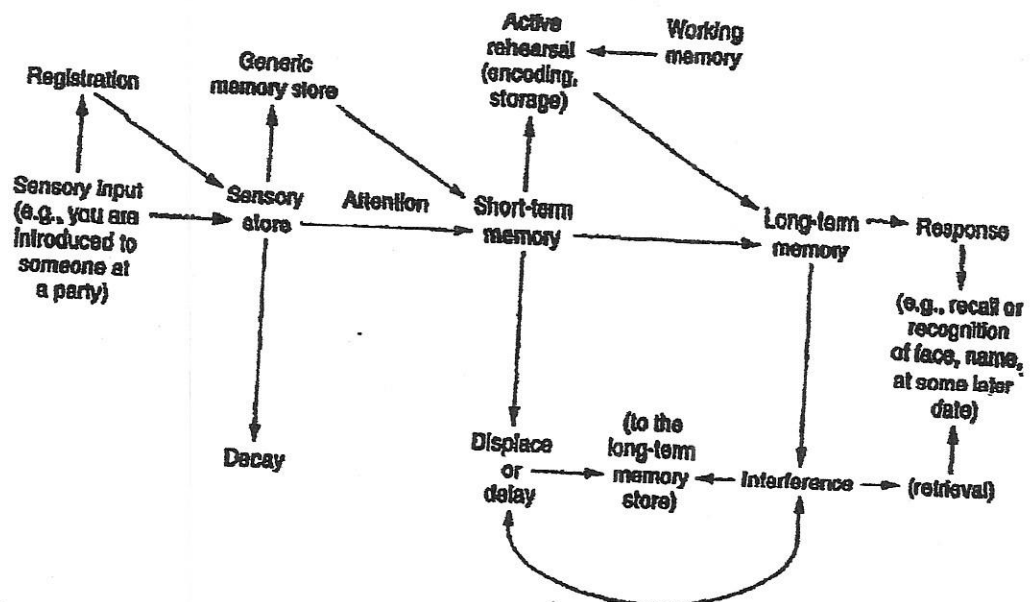


Figure 3-4. Links between memory stores via memory processes.

memory loss
 +
 emotion
 ↓
 more memory loss
 more emotion

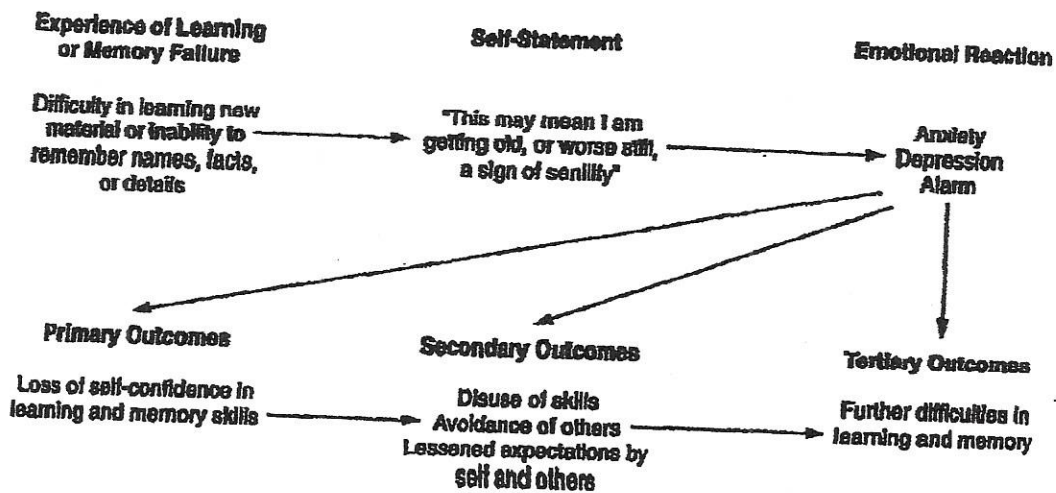


Figure 3-2. Learning and the Cycle of Memory Loss.

Box A

The E-I-E-I-O Method

Memory processes can be categorized as either explicit (deliberate, conscious) or implicit (unconscious). These two systems work somewhat independently of each other, giving us great flexibility in how information enters and is retrieved from our cognitive system. For example, people with amnesia, by definition, cannot consciously access certain information. They may wander into a police station or hospital and not be able to tell any one what their name is. This is explicit memory impairment. However, if such people are handed a telephone, they can often dial a friend or relative's phone number! This is implicit memory success. In addition to operating separately, the systems age differently, with implicit memory often being preserved even in the face of Alzheimer's disease (Camp et al., 1993).

Our strategies for remembering information are also quite flexible, and can be classified as either external (outside our heads) or internal (mental imagery). Using multiple kinds of memory and multiple strategies can significantly improve our ability to encode and retrieve information.

Students are often fascinated with the various mnemonic strategies, especially those that can be classified as internal-explicit. These include such techniques as first-letter and the

method of loci. Most of us know at least a few first-letter mnemonics. For example, to what do ROY G BIV or HOMES refer? The answers are: Red, Orange, Yellow, Green, Blue, Indigo, Violet—the colors of the optical spectrum, arranged by wavelength; and Huron, Ontario, Michigan, Erie, Superior—the Great Lakes. Sometimes we make more elaborate aids, such as: My very educated mother just served us nine pizzas. (The nine planets in order from the sun). The method of loci is an ancient memory technique that relies on creating mental images of items-to-be-remembered and a familiar location. For example, if you wanted to remember a list of items you needed from the grocery store (e.g., bananas, coffee, and bread), you could associate each item with a specific place in your living room. You then would mentally walk through your living room and say, "the couch is long and has curved ends, just like bananas. The coffee table reminds me that I need to buy coffee. The throw rug is tan, like the crust of the bread I want." Although first-letter and method of loci techniques differ somewhat, they both rely on your conscious effort (explicit) and take place inside your head (internal). These can be highly effective, but most of us would probably rely on the external-explicit strategy of making a list!

Memory system	Memory Strategy	
	Internal (inside our heads)	External (outside our heads)
Implicit (Occurs without our conscious awareness or effort)	Spaced retrieval, some biological responses, phobias	Classical and operant conditioning; some cue in the environment triggers recall
Explicit (Requires conscious attention and effort)	Mental imagery, song, first-letter, method of loci (each is a mnemonic device)	Memo books and PDAs; external reminders that we deliberately create