Craik & Lockhart

LTM storage is based on MEANING.

We do not file our memories under some sort of code system, like old library card stacks. We store memories based on meaningful associations….

The Levels-of-Processing Principle

The levels-of-processing principle states that the ease with which we can retrieve a memory depends on the number and types of associations that we form with that memory

- Superficial processing – simply repeating the material that you are trying to memorize; or processing only the sound of words.
- Deeper processing – the processing of meaning rather than simply the physical or sensory features of a stimulus. Also notes the associations between the items or parts of the material.

- Note: deeper levels of processing = greater amounts of neural activity

Retrieval Cues Provide Access to Long-Term Storage

Retrieval cues help access information, which is why recognition is easier than recall

The "encoding specificity principle" states any stimulus encoded with an experience can become a trigger

E.g., Smith et al., 1978: 80 words: same room = 49; diff = 35

Context Dependent Memory

the manner in which you study can affect your memory for information.

E.g., PLACE = retrieval cues!

- place characteristics like sound, visual cues, room features, odours, etc., get encoded with the material you're remembering

Even state dependent memory effects have been found; i.e., one's emotional or physiological state can become part of one's memory system for certain information

Priming Effects

Priming effects happen because we organize our memories in these networks of associations. This helps us organize our thinking, optimizes the efficiency with which we can retrieve information, and therefore, enables the smooth, adaptive functioning of our brains.

But as you know, this means that we are inherently biased processors, with our memories, perceptions, etc., being guided by those "nodes" that have recently been activated in our knowledge nets.

“Modal” Model of Memory

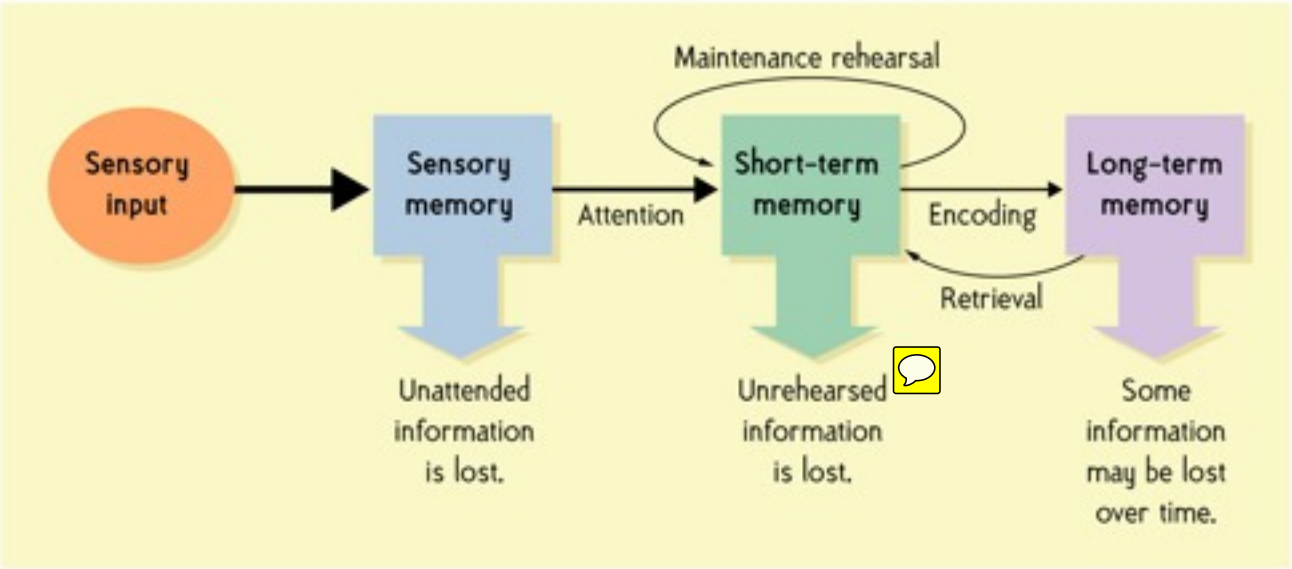
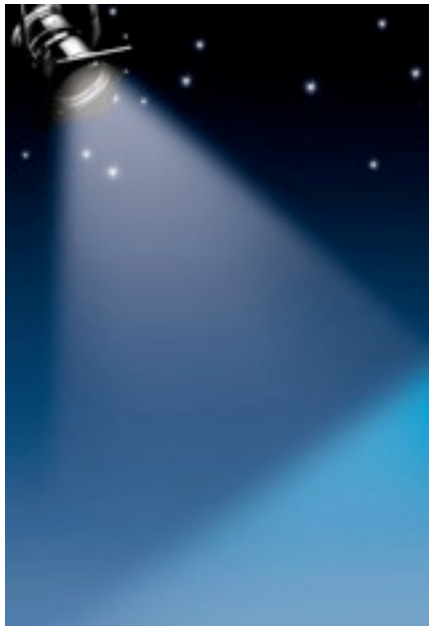
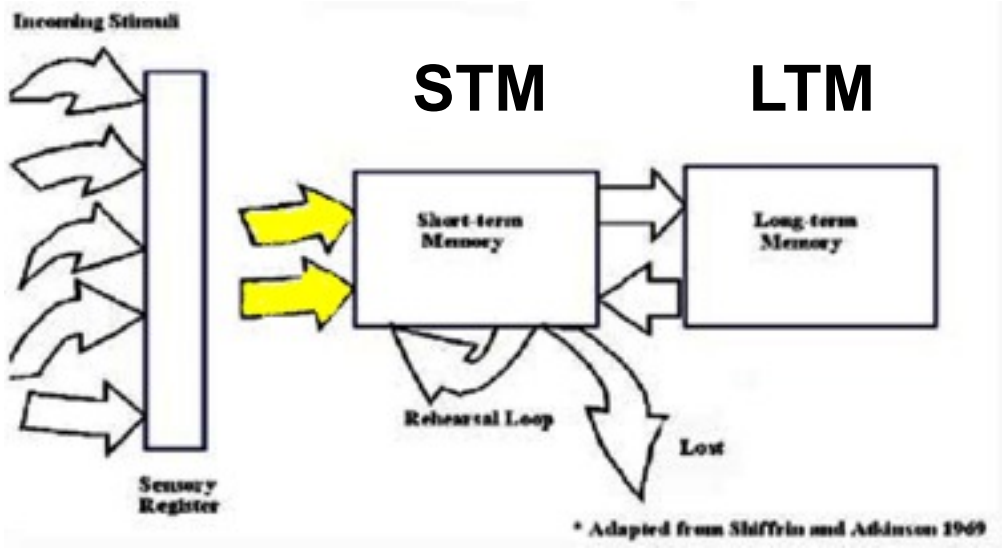


FIGURE 7.3

Attention and Memory

- Attention is the process that moves information from the sensory store to short-term memory.
- Spotlight of Attention





Inattentional Blindness

what we don’t shine the spotlight of attention on, we literally do not see, and do not store in memory `(very well)`

Short-term Memory

A limited capacity memory system involved in the retention of information for brief periods; it is also used to hold information retrieved from long-term memory for temporary use (20 - 30 seconds)

Z

6

CIA

BOY

COMPUTER

ICE
CREAM CONE

A STITCH IN TIME
SAVES NINE

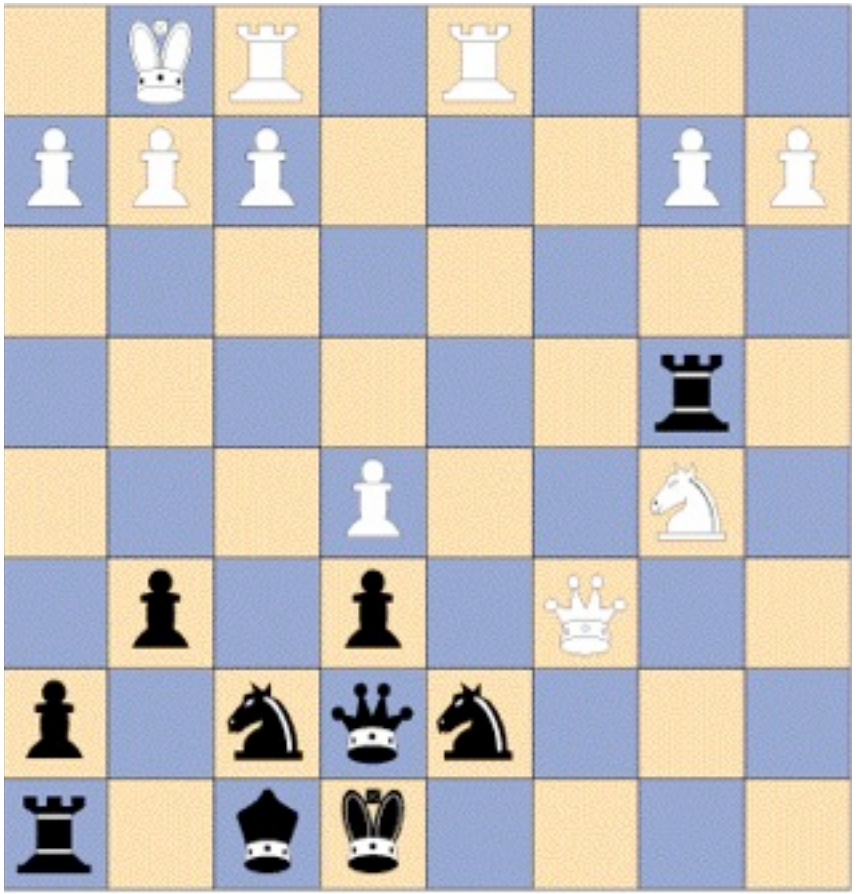
The capacity of STM is 7(+/-2) UNITS, regardless of size. So a single letter, a word, or a cliché can all count as 'units' in STM.

We overcome the limits of short-term memory through chunking; where we hold more information in single units of meaning.

The Value of Chunking

You have 5 seconds to memorize as much as you can

Now, on an empty chess board, reproduce the arrangement of pieces



Transfer from STM to LTM

For information to be remembered, it needs to be transferred from short-term memory to long-term memory.

Deficits in this ability due to injury, such as anterograde amnesia, can cause profound changes in a person

H.M.

Major epileptic seizures started at age 16

In the mid 1950s, Henry underwent brain surgery, removing much of his temporal lobes (including his hippocampus)

Suddenly, he was stuck in time, unable to encode new memories. Every moment was a new moment:

- “Right now, I'm wondering, have I done or said anything amiss? You see, at this moment everything looks clear to me, but what happened just before? That's what worries me. It's like waking from a dream. I just don't remember.”

H.M.

Henry could not remember anything new, but he could still store information in short-term, working memory.

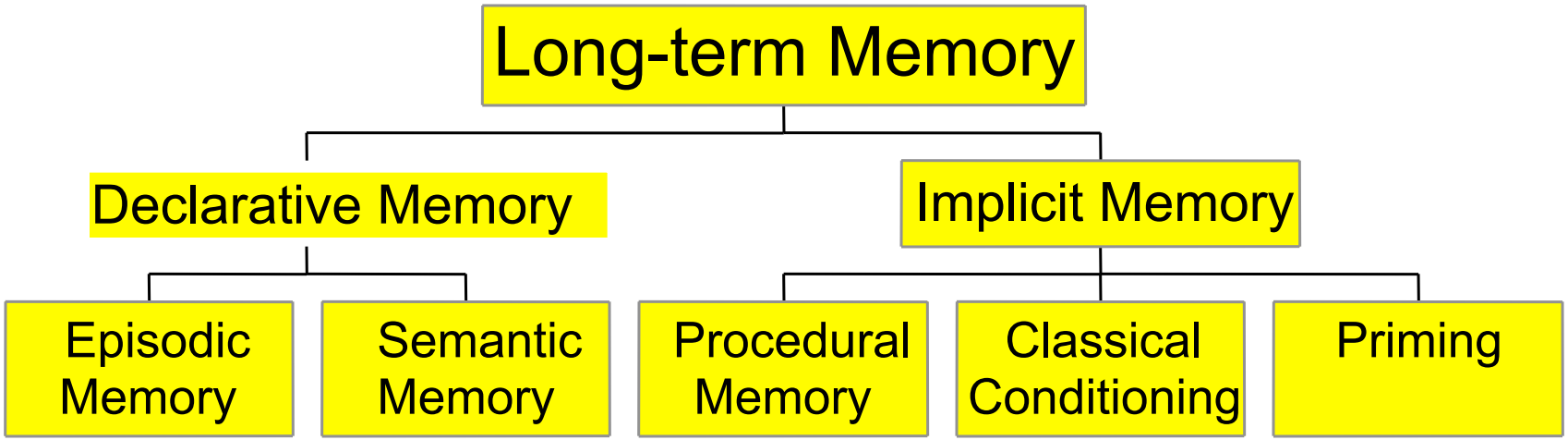
He could also recall old memories.

Therefore, researchers began to suspect that the ability to transfer information into long-term memory was localized in the hippocampus, but the storage of such memories was distributed more widely, and recalling them did not involve the hippocampus.

- Also, STM & LTM involved different systems.

Long-Term Memory

- The memory system involved in the long-term storage of information.



The Power of Suggestion

Researchers have been able to induce people to “recall” complicated events from early in life that never actually happened, such as getting lost in a shopping mall.

- phoney Disneyland commercial featuring Bugs Bunny → 1/3 to recall meeting Bugs at Disneyland!
- Some even remember specific details, such as shaking hands with BB or seeing him in a parade.

- remembering the liberation of Holland

The Power of Suggestion

What does this mean for eyewitness testimony?

The memories of eyewitnesses can be influenced by:

- The race of the witness and alleged criminal
- Leading questions
- Misleading post-event information

Leading Questions: Loftus & Palmer

Participants viewed a video of a car crash.

Two conditions:

- Control question: *How fast were the two cars going when they **contacted** each other?*
- Leading question: *How fast were the two cars going when they **smashed into** each other?*

Loftus and Palmer Study

Smashed = 65.7 km/h
Contacted = 51.2 km/h

In various scenarios, subjects could also be lead to remember broken glass (where there was none), stop signs and other details, etc…

Wording of questions can alter memories.

Children's Testimony

Children are particularly suggestible, and tend to confabulate memories.

Suggestibility is influenced by:

- Age (very young are most suggestible).
- Whether the interviewers' expectations are clear.
- Whether other children's memories for events are accessible

e.g., Martensville Saskatchewan abuse case

Studies of Child Witnesses

A young man visited children at their preschool,

- read them a story, and handed out treats.
- did nothing aggressive, inappropriate, or surprising.

1 week later, the experimenter questioned the children about the man's visit.

- Group A: leading questions ("Did he shove the teacher?")
- Group B: leading questions + influence techniques similar to those used in Martensville (telling the children what "other kids" had supposedly said, repeated questioning, etc.)

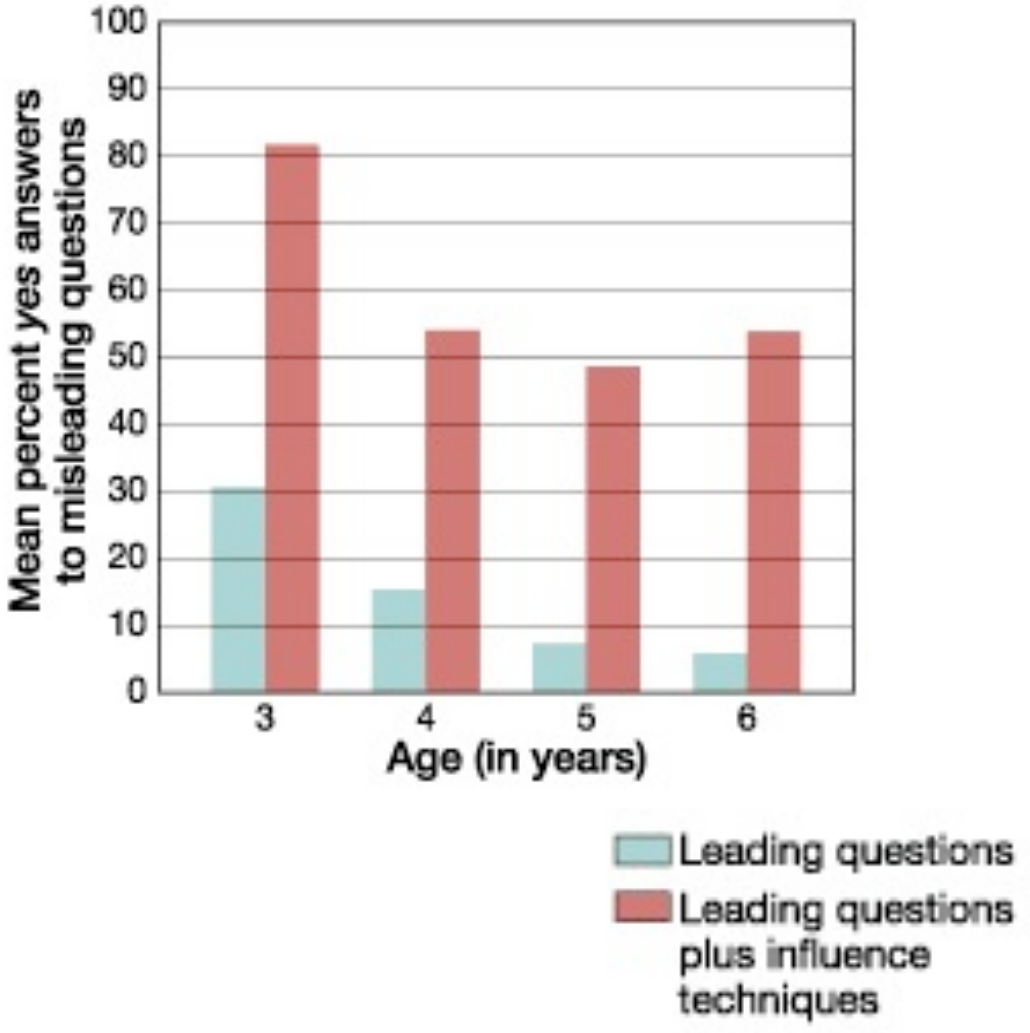
Children's Testimony

When asked if a visitor committed acts that had not occurred, few 4-6 year olds said yes.

- 30% of 3-year olds said yes

When investigators used techniques taken from real child-abuse investigations, most children (1/2 to 4/5!)said yes.

Social Pressure, False Allegations



More ways our brains deceive us….

We've talked about top-down processes, their efficiency gains, and accuracy costs.

Another way in which we deceive ourselves (some of the time) is through the use of HEURISTICS, cognitive shortcuts

stereotypes & social scripts are examples of heuristics

But there are some common reasoning heuristics that we employ much of the time, leading to less-than-ideal decisions in many circumstances

Because...

Ellen Langer: photocopy study

“Excuse me, may I use the Xerox machine?”

“Excuse me, may I use the Xerox machine, because I’m in a rush....”

“Excuse me, may I use the Xerox machine, because I have to make copies?”

Ignoring Base Rates

The representativeness heuristic:

Making decisions based on the extent to which information seems similar to a category you have in mind....

E.g., doctors often ignore base rates of illnesses when making diagnoses

Investors often ignore base rates of business failure in a sector when making investment decisions (it sure looks like a good business plan.....)

Ignoring Base Rates

Although not usually thought of in these ways, the **fundamental attribution error** involves this basic process –

-- i.e., when we see a certain kind (category!) of behaviour, we look for a "representative" explanation, such as the explanation that the person is just that kind of person, ignoring the 'base rate' represented by the situation's common influence over people

e.g., rude behaviour = rude person

e.g., helpful behaviour = helpful, kind person

e.g., lazy, undisciplined behaviour = lazy, undisciplined person

The Power of Labels

- E.g., framing effects

  Why should you take the stairs instead of the elevator?

  “Save the world”?? Or “Tone your butt”??

  Why would you change the name of the War Department to the Defense Department?

The Power of Labels

- E.g., paying more for airplane tickets

  “carbon offset” --> generating reasons why it’s a good idea --> 65 % of Republicans in favour

  “carbon tax” --> generating reasons why it’s a bad idea --> 27 % of Republicans in favour