

Long term memory

- What is Long term memory (LTM)?
- Characteristics of LTM

What is long term memory LTM?

- We know lots of things
 - Facts
 - Events that happened to us
 - Skills
- All of these are types of long term memory
 - Facts, events, and skills are very different kinds of things
 - There are different kinds of Long Term Memory
- We will begin with some basic aspects of LTM
 - Most of what we discuss today will be verbal

INSIDE ONE'S MEMORY BANK

By the time you're forty, all available spaces are completely filled.

You learn something new, something else gets thrown out.

People think they can get around this by cramming stuff into already-in-use drawers, but they're really mistaken.

And in the end, everything flows into material whose only function is to keep your head from collapsing on itself.

They're still American history bookworms and love to make you drop coffee, once again.

COMES MY NEW FAX MACHINE!!!

STRENGTH CASE SURVEY WERE STRIPS
PARENTS GEAR DEATH WERE STRIPS
DIESEL REARVIEW MOUNTAIN WERE STRIPS
INVENTS SILIQUE BAPAR WERE STRIPS

• Unlike STM, LTM has a virtually unlimited capacity.

• What is wrong with this picture?

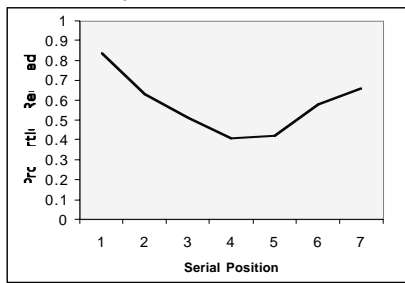
Entering information into LTM

- Principles of learning
- First look for general principles
 - What makes learning better?
 - What causes forgetting?
- Later work makes finer distinctions
 - We focus on these distinctions in the coming weeks.

Characteristics of Recall from LTM

- Give a list of meaningless items
- After a brief delay, test for recall

BKV
RQK
GLM
...
FKL

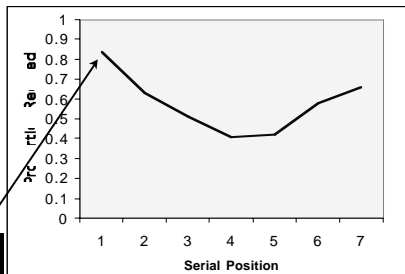


Characteristics of Recall from LTM

- Good recall for items at the beginning of the list
 - Reflects added time to study early words.

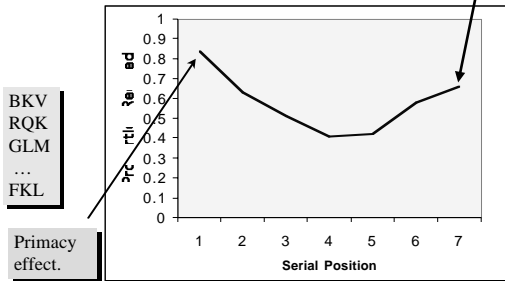
BKV
RQK
GLM
...
FKL

Primacy effect.



Characteristics of Recall from STM

- Good recall for words at end of list.
 - May reflect short term memory.



Order of recall

- Order of report in short-term recall tests
 - Start with items from the end of the list
 - Recency
 - Then report things from the beginning of the list
 - Primacy
 - Finally report from the middle
- Recency effect is fragile
 - Can be wiped out by having people count backward before recall.

Getting information into memory

- Encoding
 - The process of getting information into memory
- Retrieval
 - The process of getting information out of memory
- Encoding principles
 - Levels of processing: The harder you work at encoding, the more likely the information gets into memory.
 - Encoding specificity: The more similar encoding and retrieval, the more likely the information will be retrieved
 - Spacing effects: Repetition during encoding is better if the repetitions are spaced rather than massed.

Levels of processing

- Sometimes called *depth of processing*
- Consider three tasks
 - Case: Is the word in capital letters? TABLE
 - Rhyme: Does the word rhyme with height? White
 - Sentence: There was a _____ on the table. Pear
- How much processing do these tasks require?
 - How do you know?
- Memory
 - Sentence > Case > Rhyme

Encoding Specificity

- Context helps retrieval
 - Context may be many different things
 - Other words on list
 - Internal state at the time of encoding
 - Environmental information like odors or sounds
- The more similar the retrieval situation is to the encoding situation, the better retrieval
 - Similarity of retrieval to encoding can override depth of processing effects
 - If words are studied by rhyme, then rhyme retrieval is better than sentence retrieval
 - Normally, the reverse effect is obtained.

Spacing effects

- Spaced practice better than massed practice
 - Sorry, cramming for exams is bad...
- Why?
 - In massed practice, the context at encoding is probably similar for all repetitions
 - In spaced practice, the context will differ on each repetition
 - Some of this context is likely to match what is encountered at retrieval time.

Memory for gist

- We tend to remember the gist of things
 - Verbatim recall is tough
 - That is why reciting poems is hard
- Bransford, Barclay, & Franks
 - Read:
 - Three turtles rested on a floating log and a fish swam beneath it.
 - Three turtles rested beside a floating log and a fish swam beneath it.
 - Later recognition task
 - Three turtles rested on a floating log and a fish swam beneath them.

Elaborations in memory

- Why do we remember gist?
 - Most processing we do is in service of comprehension
 - We want to know what events mean
 - The literal form of the event does not matter
- Comprehension involves elaboration
 - The bike racer lost by 3 tenths of a second.
 - The time is important here
 - We might also infer that the racer was sad
 - All of this information might make it into memory
 - The particular time might be less likely to be remembered if the racer lost by 2 minutes and 25 seconds.

Summary

- Long term memory has a virtually unlimited capacity
- Serial position effects in recall of lists
- Encoding effects
- Encoding-Retrieval interactions
- Long term memory reflects comprehension processes.
