

Ch. 5 Short Term Memory

Early Memory Research

- **Herman Ebbinghaus** (1850-1909)
 - Conducted the first scientific studies of memory
 - Used himself as a subject
 - Memorized nonsense syllables (BUP, KIF) to avoid contamination with meaning
 - You are more likely to remember words you have associations with
 - Interested in finding the number of trials to memorize lists of varying lengths
 - Findings (2 main ones)
 - Anticipation method- memorized the list to one perfect retention
 - Up to 7 items requires a single run
 - Number of trials increases with larger lists
 - **Method of savings**- the difference between the time it takes to learn a list to perfection and the first time on subsequent trials
 - Easier to memorize later because you've done it before

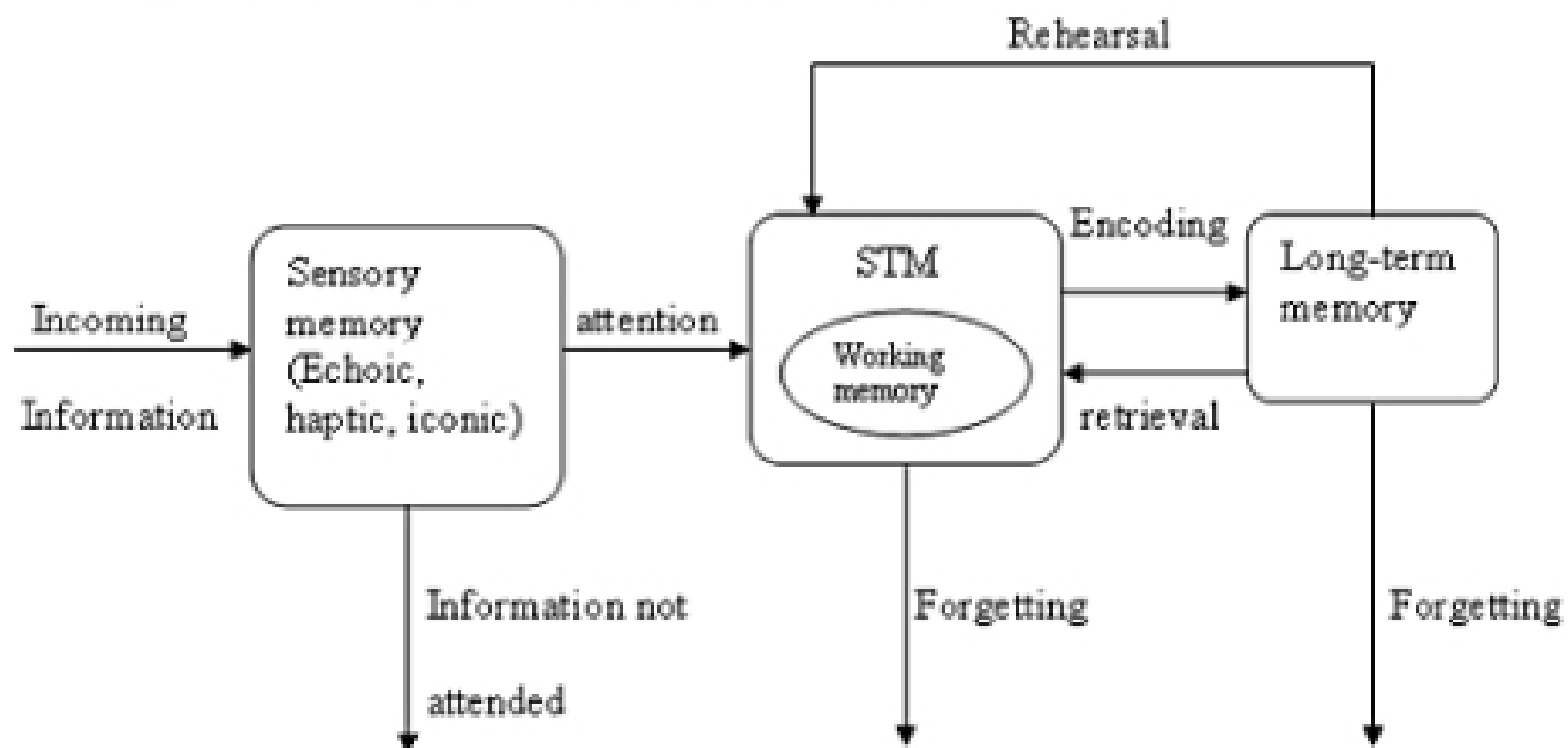
Digit Span

- **George Miller** (1950's)- studied digit span- number of digits that can be remembered
 - Supposedly worked with Bell company (hence phone numbers)
 - Miller's magic 7
 - Findings
 - 7 numbers or less- 1 trial to get it right
 - 8 numbers- some people need 2 trials
 - Described **chunking** strategy (makes it easier to remember long list of numbers if you break it up into chunks)
 - Digit span increases with age until adulthood

Atkinson & Shiffrin's Standard Model (1968)—most important model of memory

- Three different types of memory- sensory, short term, long term
 - Sensory memory- during every minute information is taken in by the senses, items are held in sensory memory for a very short period of time- just long enough to be transferred to short term memory (consciousness)

- o **Short-term memory**- information you have in mind at a particular time, also called working memory, lasts 17 to 30 seconds then decays, information can be transferred to long term memory
- o **Long-term memory**- information can be encoded into permanent storage and retrieved at a later time; potentially unlimited
- Sensor store- repetition of sensory information (seconds, milliseconds) before it's transferred to short term memory (everything you care currently thinking about- so not really memory yet)



Sensory Memory

- **Sensory Memory**
 - o During every minute information is being taken in by the senses
 - o Items are held in sensory memory for a very short period of time- just long enough to be transferred to short term memory (consciousness)
 - o Information decays over time or items are displaced by new incoming information
- **Sensory Stores**
 - o **Echoic memory**- auditory sensory store, lasts the longest, 3-4 sec.
 - o **Iconic memory**- visual sensory store, very brief, 100 milisec. (e.g. trails of light)
 - So short b/c we don't need it to be long b/c our eyes are constantly refreshing with saccades
 - o **Haptic memory**- touch sensory store, lasts about 2 sec.

Encoding, Storage, Retrieval

- Encoding- coming into the hippocampus, short-term memory
- Storage- being sent out to various parts of the cortex, long-term memory
- Retrieval- getting memories out of the long term memory in the cortex, back into the hippocampus (closer to midbrain than outer cortex) and back into consciousness
- Is forgetting a problem of storage or retrieval?
 - Nobody knows

Brown-Peterson Task

- Brown (1958); Peterson & Peterson (1959)
 - Studied the duration of short term memory
 - Subjects:
 - Remember a trigram (e.g. MHA)
 - Begin counting backwards by three, (e.g. start at 368)- to prevent strategies such as rehearsal
 - Recall interval- varied the duration of counting (3, 6, 9, 12, and 15 seconds)
 - Findings:
 - Performance declined with increased duration of counting
 - Conclusion- duration of unrehearsed information in STM is 18 seconds
 - Information in short-term working memory decays over time- to make room for new information

Interference

- **Decay**- information is lost due to decay, time is the factor
- Brown-Peterson interference task (1959)
 - Subjects performed the Brown-Peterson task over multiple trials- due to interference of previous information- this is proactive interference

Proactive and Retroactive Interference

- Proactive Interference
 - Older materials interferes forward in time with recollection
 - Numerous trials, performance declines with each additional trial
 - Proactive interference “builds up”- more PI, interference