Origins of Memory
- Babies remember, forget and can be prompted to recall forgotten material.
- Fun with Mobiles (Rovee-Collier)
  - 2mo 1-3 days
  - 6mo 15-16 days
  - Both could be cued.

Strategies for Remembering
- Necessary for effective remembering.
- Children gradually learn to use them during childhood.
- Embed them in a more general approach.

The Development of Memory Strategies
- **Rehearsal** (repeating something over and over until we think we will remember it)
  - 3- to 4-year old children rarely rehearse.
  - 7- to 10-year olds rehearse more efficiently than younger children.
  - 12-year-olds rehearse clusters.

More Memory Strategies
- **Organization**: 9- to 10-year-olds begin semantic organization.
- **Elaboration** as a strategy is rarely seen prior to adolescence.
- Retrieval processes can be enhanced through cued-recall questions.
- **Metamemory** increases dramatically between ages 4 and 12, but this may not necessarily increase memory performance.

Fuzzy-Trace Theory
- People encode experiences on a continuum from literal, verbatim traces, to fuzzy, gist-like traces.
- Gist: A fuzzy representation of information that preserves the central context but few precise details.

Autobiographical Memory
- People’s memory of their own lives is autobiographical memory.
- Infantile amnesia denotes forgetting of events from early in life.
- Why?
Remember Schemes?

- Schemes - psychological structures that organize experience.
  - Categories are a type of scheme that tells us how group of things go together.
  - Stereotypes are also a type of scheme for how we think about types of people.
  - Scripts are a type of scheme which describes the sequence in which things occur.

The Development Autobiographical Memory

- Development of scripted memory begins by age 2.
  - Young children organize and interpret their experiences through scripts (bedtime, bath time, hammer time).
- The social construction of autobiographical memories.
  - Autobiographical memory begins as a joint activity between children and adults.

Children as Eyewitnesses?

- "Free recall" is generally accurate.
- Stereotype and suggestions can be very detrimental.
  - Leichtman and Ceci
    - Control condition.
    - Stereotypes condition (Sara is nice but clumsy).
    - Suggestions condition (Remember when Sara ripped the book?)
    - Stereotypes plus suggestions condition.

How suggestible are child witnesses?

- Children younger than 8 or 9 are highly susceptible to false memories.
- Implications for legal testimony.
- Leading questions should not be asked.
- Caution children that "I don't remember" answers are better than guessing.
- This is true (to a less extent) for adults.

Why do they fail?

- Fail to encode all the features of the problem.
- Fail to plan ahead.
- Don't know essential facts.
- Confound variables.
- Jump to conclusions.
- Have trouble integrating theory and data.

Why do they succeed?

- Know Heuristics.
- Means-end analysis.
- Use multiple strategies.
- Will Collaborate!
- Solve Scientifically!
- One variable at a time.
- Multiple studies.
Reading

- Prereading skills: knowing letters, and letter sounds (phonological awareness).
- Kindergarten children who know their letters learn to read faster (automatic processes).
- First graders who recognize rhyme and onset (phonological awareness) also do better (89% correlation).
- This lead to Dr. Seuss, which is good, but…

Recognizing words

- Must DECODE individual words.
- Sounding out: ass—ppp—eye—dd—or
- Whole word recognition
  - Depends on familiarity.
  - Number of options.
  - Sentence context.
  - If you don’t recognize the letters, can’t find the sounds, have reading difficulties.

Comprehension

- Even if recognize words, need to know what they mean.
- Comprehension: The process of extracting meaning from a sequence of words.

Comprehension (Semantics)

- Children derive meaning by combining words to form Propositions.
  - The German monkey jumped back...
  - There is a Herby
  - It is a German
  - It is jumping
  - And so on

Reading Comprehension Summary

- Good comprehension depends on:
  - Decoding
  - Working Memory
  - Knowledge
  - Monitoring
  - Reading Strategies.

Decoding

Easier it is to recognize the words, the more capacity can be devoted to comprehension.
Working memory

- The more you can remember, the easier it is to figure out the propositions.
- Who did what?
  - The boy that hit the cat that ate the rat sat.
  - The boy that hit the cat ate the rat and sat.
  - The boy for the cat that ate the rat sat.
- Embedded propositions are hard.
  - The boy the cat bit was ok.
  - The boy the cat the dog chased bit was ok.
  - The boy the cat the dog the man beat chased bit was ok. (I give up!)

Knowledge

- If you don't know, you can't understand.
- I can read an advanced chemistry text, but I don't get it.
- A kid can read about who got elected president, but they probably won't get it either.
- Like a PC Mister Rogers: "can you say 'ethnically integrated' boys and girls?"

Monitoring

- Monitoring is a kind of metacognition.
- You monitor your comprehension, and go back when you hit a bump.
- The horse raced past the barn fell.
- "[The horse] [raced past the barn] fell?"
- [The horse raced past the barn] [fell].

Reading strategies

- Speed reading courses abound.
  - Anyons take one!
  - Two ways to go faster:
    - See words quickly
    - Skip past redundant parts.
  - For textbooks
    - Get the gist by reading the headings.
    - Get the keywords.
    - Dive in where unclear.

Writing

- Older writers have more to tell.
- Older writers know how to organize
  - Not knowledge-telling!
  - Knowledge transforming!
  - It's the story stupid!
  - We don't care what the writer had for breakfast in the Gettysburg address!

Writing

- Older writers are better able to revise.
- Older writers are better able to deal with the mechanical requirements of writing.
  - Spelling and punctuation can trip you up.
Knowing and Using Numbers

- Babies distinguish quantities.

Counting

- Preschoolers’ counting is principled even though it’s full of errors. (Gelman & Meck)
- One-to-one principle.
- Stable order principle.
- **Cardinality** principle (3 - 5 years).

Addition and Subtraction

- Children use different strategies to add and subtract.
- First, concrete (like Piaget said):
  - Apart and count.
  - Together.
- Not uniform.
  - Like reading, try and do it from memory and if that fails, then use the rule.

Counting and Arithmetic Strategies Summary

- Counting normally begins shortly after children begin to talk.
- Cardinality developed by age 4.5 to 5 years.
- Development of mental arithmetic begins during the early grade school years.
- Early strategies still based on counting.
- Later strategies include fact-retrieval.

Cultural Influences on Mathematics

- Arithmetic competencies of unschooled children are typically good when problems involve real-life situations.
- Cultural variations in arithmetic among schooled children.
- Linguistic supports: Number-naming systems facilitate or inhibit development of basic arithmetic skills.
- Instructional supports (such as practice) increase the development of arithmetic skills.

- more time in school
- more time on homework
- parents have higher standards
- parents emphasize effort