

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

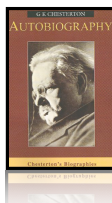
- **Organization:** 9- to 10-year-olds begin semantic organization.
- **Elaboration** as a strategy is rarely seen prior to adolescence.
- Retrieval processes can be enhanced through **cued-recall** questions.
- **Metamemory** increases dramatically between ages 4 and 12, but this may not necessarily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

- Development of scripted memory begins by age 2.
- Young children organize and interpret their experiences through scripts. (bedtime, bathtime, 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. (Sam is nice but clumsy).
 - Suggestions condition (Remember when Sam 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:** sss---ppp---eye---dd--er
- **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 Monkey.
 - It is 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 hit the cat that ate the rat that 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.
 - Anyone take one?
- Two ways to go faster:
 - See words quicker.
 - Skip past redundant parts.
- For textbooks
 - Get the gist by reading the headings.
 - Get the keywords
 - Dive-in where unclear.

Writing

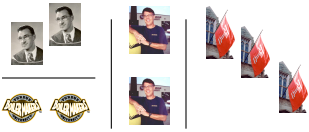
- Older writers have more to tell.
- Older writers know how to organize
 - Not knowledge-telling!
 - Knowledge transforming!
 - It's the story stupid!
- We don't care what the writer had for breakfast in the Gettysburg address!

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 accelerate 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

