Memory & Recall
A general framework for memory

- Perceptions
- Categories
- Preferences
- Attitudes

Working Memory

- Representation of stimuli
- Organization of representations
- Comprehension of representation
- Evaluation of representation

Stimuli
- Exposure
- Attention

Recall

Other mental processes
**Short term memory**

- **Stimuli**
- **Exposure**
- **Attention**
- **Other mental processes**

**Working Memory**

- **Representation of stimuli**
- **Organization of representations**
- **Comprehension of representation**
- **Evaluation of representation**

**Perceptions**
- **Categories**
  - **Representation**
  - **Criteria**
- **Preferences**
- **Beliefs**
- **Attitudes**

**Long Term Memory**

**Duration:** short, about 15-20 sec.
- can be lengthened through rehearsal

**Capacity:** 7 + or - 2
- chunking
Not really long term. Some things are constructed, some last forever.
No capacity constraints!
Visual, verbal, conceptual, procedural etc.
Individuals represent stimuli in context-dependent perceptions; these perceptions are all the reality for the individual.
Knowledge in the individual’s mind (including the perceptions) is organized into hierarchical categories.
The individual understand stimuli by forming or updating beliefs and expressing preferences.
Individuals evaluate certain representations; the evaluation is called a judgment (if it is operational) or an attitude (if it is not).
A general framework for memory

**Stimuli**
- Exposure
- Attention

**Other mental processes**
- Recall

**Working Memory**
- Representation of stimuli: Perceptions
- Organization of representations: Categories, Representation, Criteria
- Comprehension of representation: Preferences, Beliefs
- Evaluation of representation: Attitudes

**Long Term Memory**
Specific memory effects
Constructed memory
The memory myth

- We usually think about our autobiographical memory as a veridical representation.
- This is not the case!
- Memory is constructed.
Evidence (Loftus & Pickrell)

- Adult participants were implanted with a childhood memory that at age five they had been lost in a shopping mall and rescued by an elderly person.
- People falsely remember shaking Mickey and Bugs Bunny’s hand at Disneyland.
Evidence from cases of early child abuse

This is not to say that there is no child abuse

Some people don't accept this evidence

How could you study this level of constructed memory?
Alien Abduction!

Susan Clancy
Susan Clancy showed that people who claim that they were abducted have many more false positive memories & that they are higher on the autism scale.

She also proposed a “sleep-awake” mechanism.

This work has help not only to show that false memory are real and that they have real impact on people, but helped us understand the mechanism underlying it.
Source monitoring

Even when we remember we don’t necessarily remember where the information is from
Implication

- The legal system usually treats person eye witnesses and memory as the highest level of accurate evidence.
- The same goes in our personal and professional life.
THE MERE EXPOSURE "Costanza" EFFECT:
We like things that are familiar
Zajonc (1968) showed Chinese characters to people from one to 25 times, asking them to guess the meaning. The more they saw a character the more positive a meaning they gave.

Miller (1976) showed people posters about stopping foreign aid up to 200 times. They were persuaded most by moderate exposure. After 200 exposures they reacted negatively to the message!
Organizational memory

- People use memory as an asset and as a tool to ensure their position.
- Knowledge management is an attempt to get out of this problem.
Urban legends

This is another version of collective (constructed) memory

- You only use 10% of your brain.
- The Great Wall of China is the only man-made structure visible in space.
Halloween

Newsweek, 1975:
“In recent years, several children have died and hundreds have narrowly escaped injury from razor blades, sewing needles, and shards of glass purposefully put into their goodies by adults.”

ABC News poll, 1985
60% of parents worried their kids might be victims
Mad cow in France

Scientific papers, and newspapers

Courtesy of Chip Heath. Used with permission.
Mad cow II

Mad cow had a real effect on beef consumption in the US.

- How many people died?
- How many people die each year of salmonella?
Urban legends summary

- Urban legends are a "collective false memory effect"
- Common and interesting
- Real effects on the market
- An important question is what makes a "good" urban legend?
- What predicts that a story will become an urban legend?
Applications I

- Eyewitness Testimony
- Improving memory
  - Make meaningful (self)
  - Make Salient (images)
  - Rehearsal
  - Mnemonics
Technological aids

The Remembrance Agent
Brad Rhodes
ARIA: An Agent for Integrated Annotation and Retrieval of Images
Memory Prosthesis
Visualizing health
The Remembrance Agent

 Watches over the shoulder of the wearer of a wearable computer and displays one-line summaries of notes-files, old email, papers, and other text information that might be relevant to the user's current context.

 Brad Rhodes
ARIA:
[Annotation and Retrieval Integration Agent]

☐ Assists users by proactively looking for opportunities for image annotation and image retrieval in the context of the user's everyday work

☐ Continuous, ranked searches are automatically performed from an image library, and images relevant to the current text can be inserted in a single click

Henry Lieberman
Memory Prosthesis

- computer attempts to determine the most important parts within audio recordings.
- Speaking
- Tone
- Humor

tries to pick a good set of short audio clips that, in turn, will serve as good memory triggers

Sunil Vermuri

Courtesy of Sunil Vermuri. Used with permission.
Visualizing health

Photo journals and data visualization to understand health practice

Jeana Frost
Other examples

- Cell phones
- Auto complete
- Google
Summary

- Memory is complex and important
- Memory is about organization and “sense-making” -- and hence not always accurate.
- We have volitional access to some aspects of memory but not others
- Memory is a central psychological process that almost everything we do depends on.