

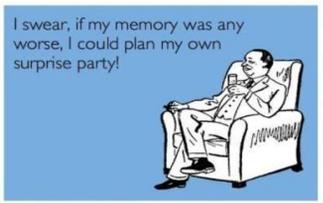
Memory

Information Processing Model

Encoding: how info gets into our memory

Storage: keeping the info in our memory over time (Rehearsal)

Retrieval: remembering information from our memory



Types of Retrieval

Recall: without help/cues (7 Dwarfs, your address)

Recognition: with help/cues (multiple choice questions)



Types of Memories

Episodic: an event
I remember going to homecoming my 10th grade year...



Semantic: a fact
□ I remember that the occipital lobe processes vision

Procedural: how to
□ I remember how to ride a bike

Types of Memory



Explicit Memory- when you try to remember stuff

□ I am trying to remember where I put my prom pictures

Implicit Memory- involves unintentionally remembering stuff

□ I am remembering how much fun prom was while I look for pictures ☺

Memory Models

Levels of Processing: what you remember depends on how deeply you process stuff

- Maintenance= repetition
- Elaborative= relate it to new info
- Effortful vs Automatic



Multi-storage Model

Information Processing: sensory memory is perceived, stored in short-term memory then gets encoded into long-term memory

Notice you have to be paying attention...memory is an active process!!!!



Sensory Memory

It's all about selective attention...

Your senses take in information, if you are paying attention it gets stored in your sensory memory.

Iconic vs Echoic

Short Term Memory

STM= limited amount of info stored for a limited amount of time...most say about 18 seconds

Working memory= mentally working with information in our STM

Remember 2,3,6,7 Add them together

STM

Working

Short Term Memory

Your immediate memory span is the largest number of items you can recall after hearing them once...

Miller +/-7



The Power of Chunking

Chunking can help us hold more info in our STM

Grouping similar info- all dairy on the store list...
Remembering your lines by act and scene...
Waiters who remember chunks of your order...



Long-term Memory

Memory system that encodes and stores more information for longer periods of time (some say unlimited info for unlimited time...)

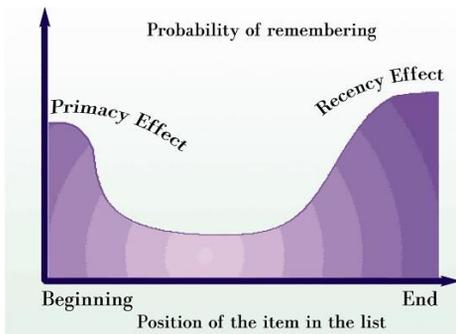


Flashbulb Memories

Remembering something vividly because of its importance



Serial Position Curve



Context, Mood and State Dependency

You recall better in the same environment you learned in...

And in the same mindset...

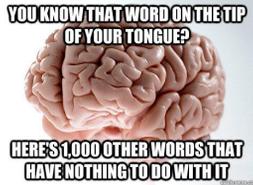
And in the same mood...



Incomplete Knowledge

Tip-of-the-tongue phenomenon: almost...but not quite able to remember

Feeling-of-knowing: recognition, but not recall



Constructing Memories

We use schemas to help us remember, so sometimes we add stuff that wasn't there.

Spontaneous Generalization: if I tell you I bought a car, you assume it has four wheels...can lead to prejudice

[The Bunny Effect](#)

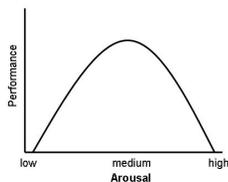
Eyewitness Testimony

Picking Cotton

It can be swayed, high arousal might contribute to you not remembering correctly...

Yerkes-Dodson Law: performance including memory, can be impacted by high arousal!

False Memories DO EXIST!

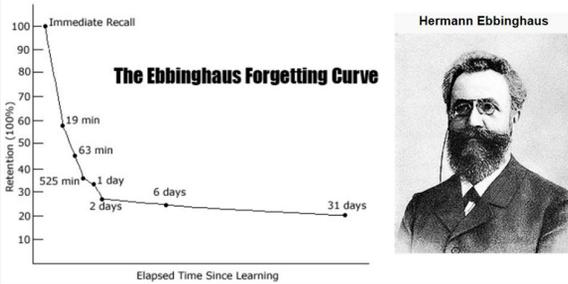


Forgetting



Forgetting

Ebbinghaus's Curve of Forgetting



Forgetting

Decay: information gradually disappears

OR

Interference: information is impaired by other information

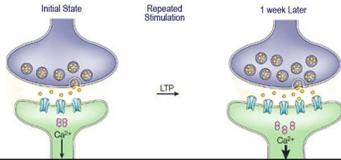
Retroactive: new learning interferes with old

Proactive: old learning interferes with new

Biological Basis of Memory

Synaptic Connections:

- New synapses are made with increased signals
- Existing synapses are made more sensitive with repeated firing (long-term potentiation)



Biological Basis of Memory

The more you do something, the stronger your neural connections get- the better you get at it!!!

PRACTICE DOES MAKE PERFECT IN THE BRAIN!!!!

Biological Basis of Memory

Hippocampus- plays a part in new memory formation

NTS: Glutamate and Acetylcholine (ACh) also play a role

Learn about memory through:

Case studies ([H.M.](#)) and PET/fMRI Scans

Amnesia



Anterograde Amnesia: no new memories
Like H.M. and Lucy from *50 First Dates*
Retrograde Amnesia: backlog of memories is erased
Most patients regain their memory

Memory is Stored in Many Different Areas of the Brain

Hippocampus and thalamus send impulses to the cortex...

Association areas store information.

Visual association area stores the visual, auditory the sounds, the cerebellum stores procedural knowledge...

Retrieval comes from the cortex and the hippocampus

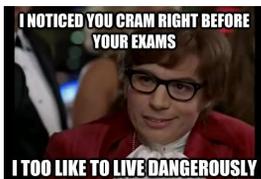
Improving Your Memory

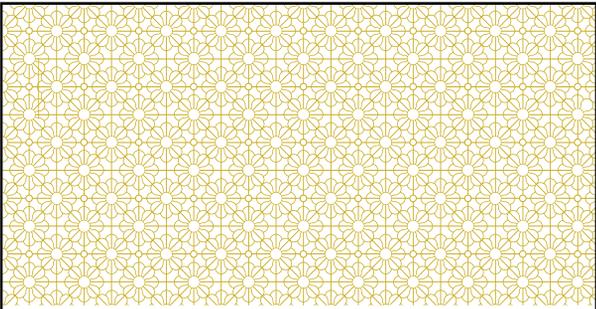
Mnemonics: key words, peg words, acronyms...

[Method of Loci](#): make a mental map

Practice a little each day (distributed practice) rather than cramming (massed practice)

[Eidetic memory](#)- can't be trained ☹





Cognition and Language | Chapter 8

Cognitive Psychology

Study of mental processes by which info from the environment is received, modified, given meaning, stored, retrieved, used and communicated to others.



How Do We Represent Information?

Concepts: categories with common properties or features

Formal: defined by set rules

Natural: no fixed set of rules but typical properties



How Do We Represent Information?

Prototypes: the BEST example of a natural concept



How Do We Represent Information?

Proposition- connections between concepts
Birds (concept) have feathers (concept)

Schemas- generalizations about the categories

Scripts- sets of schemas about a familiar activity



Mental Models

Mental models- the way in which you mentally represent information
Images- visually representing a mental model
Cognitive Map- a mental map of an area

Thinking Strategies

Reasoning- to generate and evaluate an argument in order to reach a conclusion.

Confirmation bias- you pay more attention to the information that supports your hypothesis!

like self-fulfilling prophecy but not just about people...



Heuristics

MENTAL SHORTCUTS

Examples:

Anchoring heuristic: we set an anchor in our thoughts based on existing knowledge

**first impressions!*

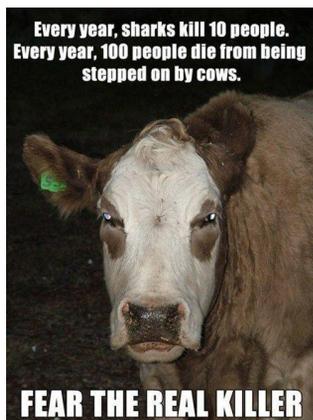
Representative: we group things together, make assumptions

Availability: we make judgements based on the easiest info available



Heuristics

Try the handout!



Problem Solving

Algorithms: step by step way to solve a problem
Can lead to...

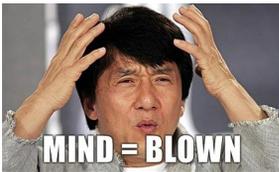
- Mental Set: doing things in the old way even when it's not the best

AKA-*Functional Fixedness!*



Bernstein on Problem Solving...

"In other words, there is a fine line between using past experience and being trapped by it. Experience alone does not ensure excellence at problem solving, and practice may not make perfect"

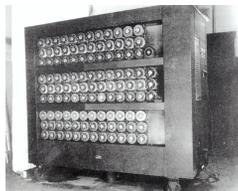


Artificial Intelligence

creating computers that imitate the process of human perception and thought

We have to know how we think if we are going to make computers who think
*Neural Networks!

Alan Turing- the Turing Test

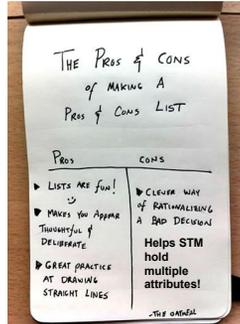


Decision Making

Look at the *attributes* of the choice (features- both positive and negative)

Short-term memory is not good at holding multiple *attributes*...

This is why Mrs. Bova makes pro-con lists ☺



Framing

Framing: how a question is posed (or framed) will alter judgement, decision making and recall

Usually in terms of a gain or loss...

Would you rather have a 10% chance of mortality, or a 90% chance of survival?

Belief Perseverance

The tendency to cling to your beliefs despite information to the contrary

Tom Brady is the best QB in the NFL!

Santa Claus is real!

I believe what I believe- don't confuse me with the facts!

Overjustification Effect

COGNITIVE DISSONANCE!

When an external reward lowers our intrinsic motivation (“we learn to love what we suffer for”)

Kids played with toy → told they would be given a reward if they played with toy → next day didn't want to play with the toy unless there was a reward

[What English sounds like to non-English speakers](#)

Language



Elements of Language

Symbols (letters) Rules (grammar)

Phoneme: smallest unit of sound that AFFECTS meaning

Morpheme: smallest unit that HAS meaning (prefix, root word, suffix)

CAT



Phonemes vs Morphemes

cream.....4 phonemes (/k/r/ē/m/)
knock.....3 phonemes (/n/o/k/)
shadow.....4 phonemes (/sh/a/d/ō)

submarine...2 morphemes
(sub/marine) eight phonemes: s,
u, b, m, a, r, i, n (e is silent)

Elements of Language

Word- 1 or + morphemes

Syntax- rules for language telling us when words=sentences

Semantics- rules for language telling us when sentences have meaning

Syntax but no semantic-

Colorless green ideas sleep furiously

- Noam Chomsky

Understanding Speech

Includes your context and expectations:
bottom up processing!

Non-verbal cues



Language Development

4 months- babbling

9 months- sounds of language

10-12 months- understanding then talking

12-18 months- vocabulary grows word by word (one-word stage)

2 years- 2 word (telegraphic) then 3 word combos

3 years- auxiliary words

This is what happens...but HOW?!?



Language Acquisition

NOT positive reinforcement but... MAYBE a little modeling

PERSONAL ANALYSIS! Babies analyze the world around them to learn language

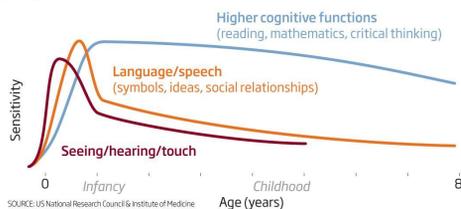
Chomsky says we have universal grammar (innate/nature) that adapts to what we hear (nurture) and a Language Acquisition Device (LAD)- innate ability to learn language

[Noam Chomsky on Language Acquisition and Memory Formation](#)

Critical Period

There is a period in which language (and second language) is most easily learned

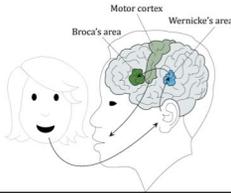
- Genie



Broca and Wernicke's

Broca's area- produces speech, if damaged language is bbbbroken

Wernicke's area- comprehends language, if damaged word salad results





Linguistic Determinism vs Relativism

Linguistic determinism= language determines the way we think about the world (language determines thought)

Linguistic relativism= Whorf-Sapir Hypothesis, language influences our experience of the world and our thoughts (softer version of L.D.)