Learning to Learn

Temple University

How will these rules help you in this class?

- You need to memorize
  - authors names, their hypotheses, critical brain regions, etc.
  - You' ll need to memorize writing tips and techniques that you learn in this course
    - You need to internalize your writing flaws so as to overcome them, thus improving your future scientific writing skills

Nine Rules for Superior Learning and Memory

1. Pay attention
2. Create new associations
3. Use deep encoding
4. Throw in some emotion
5. Get aerobic exercise
6. Use imagery
7. Capitalize on order
8. Practice retrieval
9. Distribute studying

1. Pay attention,look around

- Attention is key for memory formation
- If you want to improve your spatial memory, look around and think about what you see
  - Do not let yourself become overly reliant on GPS
- Turn off the internal dialogue, and tune in to the outside world

2. Create new associations

- Try to remember this list of eight words:
  - Rose
  - Bag
  - Elephant
  - Crystal
  - Clown
  - Ladder
  - Kite
  - Lamp

Test: Who can remember them all?

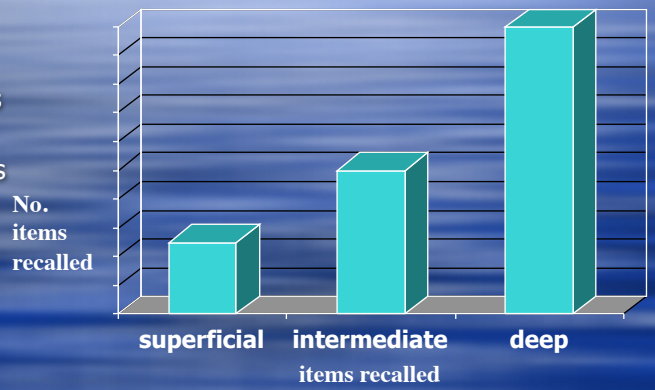
The trick: associate each word with the next

The rose was in the paper bag when the crystal elephant fell on top of it. The clown on the ladder laughed so hard he let go of his kite which got caught in the lamp.

3. Use deep encoding

Deep processing means thinking about meaning, what the stimulus means to you.

Shallow: how it looks



Called the "levels-of-processing effect." Discovered by Craik And Lockhart in 1972.

4. Throw in Some Emotion

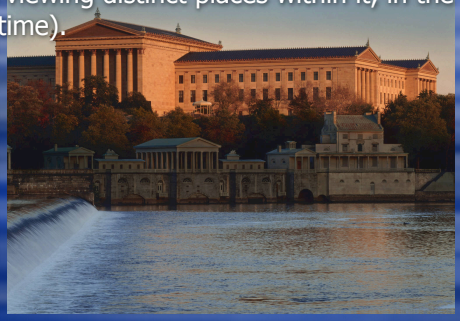
- We preferentially remember things with emotional content
  - The amygdala comes on line, links the memory episode with emotion
- Can be psychologically harmful in some instances;
  - Post-traumatic stress disorder
  - Phobias

5. Get Aerobic Exercise

- In older adults, it is known to improve memory.
- Why?
  - Exercise increases blood flow to your whole body, including your brain. Blood is “food” for your organs
  - May also increase neurogenesis.

6. Use Imagery

- Ancient greek and roman orators used an imagery method to remember long speeches.
  - How to do it: Begin by choosing a well-known route (if you don't have one, choose one and walk through it several times viewing distinct places within it, in the same order each time).

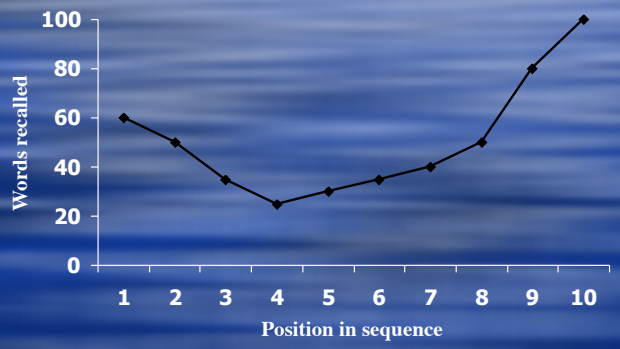


- Ancient greek and roman orators used a variant of the "method of loci" to remember long speeches.
  - Imagine a well-known route (if you don't have one, choose one and walk through it several times viewing distinct places within it, in the same order each time).
  - Choose a sequence of places (=loci) on that route.
  - Break up your speech or list into pieces, each of which is symbolized by vividly imagined objects of symbols.
  - Place each piece at a loci.
  - Recall in order by imaging that you are walking down the route again, visiting each loci in order.

Note that this method is used by most top memorizers
In memory competitions, ex. Dominic O'Brian

7. Capitalize on order: you will always remember the first and last things of a series the best

- "serial position effect" Ebbinghouse



Implications of serial position effect

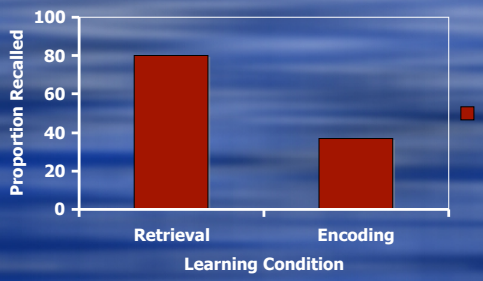
- Is it best to be the first or last candidate interviewed for a job
- You will remember the first and last concepts discussed today better than the middle ones.
- Your parents will have stronger memories of their first and last children

Because of this effect, you need other strategies for remembering the *middle stuff.*

8. Practice Retrieval

- When trying to learn new information, most students practice the *encoding* information by rereading and underlining text. Over the short-term, this it good, but if you want to retain information, you need to practice *retrieval.*
- *Retrieval is the process of bringing to mind past encoded information.*
  - *Tests = retrieval practice.*

- Karpicke and Roediger (2008) had college students learn a list of 40 Swahili-English word pairs in a study period. Once a word pair was recalled correctly, it was
  - (a) dropped from further study but tested each test (so no additional encoding but there was instead additional retrieval; = retrieval condition)
  - (b) retained in study but dropped from test (so no additional retrieval but instead there was additional encoding; = encoding condition)
- Over the short term, all subjects learned word pairs to criterion (100%)
- They were brought in a week later and retested:



- How can you practice retrieval?
  - Test yourself. Continue you test yourself on information that you believe you have learned.
  - Talk about the class material with a friend. Talking about something forces you to retrieve information.

9. Distribute study sessions

- multiple training sessions with rest intervals (called distributed or spaced training) results in a more robust and long-lasting memory trace then the same amount of training with no rest intervals (=massed training)
- This law exists in almost every domain examined:
  - For all material types and tasks: verbal, perceptual and motor tasks
  - In infants and in adults
  - In vertebrates and invertebrates

  * Discovered by Jost, 1897
- How can you do this? Study little bits over time, don't cram at the last minute

Conclusions

- Many of these rules apply best to coursework that requires rote memorization such as learning anatomy
- Other rules, such as distributing studying and practicing of retrieval, can be broadly applied

How to Instantiate these Rules

In the Classroom

1. Pay attention: if you have a hard time paying attention in class try taking notes, try asking questions or sitting in the front row
2. Create new associations : link what we discuss with other things you've seen, heard, or experienced
3. Use deep encoding : think about the films and readings as you experience them; jot down questions; jot downs flaws or open questions
4. Throw in some emotion (get excited!)
5. Order effects imply that you'll especially need to use these strategies in the middle of each class since this is the information that is retained most poorly

Home

1. Get aerobic exercise
2. Use imagery: try to visualize brain region of interest; try to remember author's names using method of loci
3. Practice retrieval: test yourself and if you ace it, continue to test yourself
4. Distribute studying: devote small amounts of time each day to this class