Improving memory

PSY 200
Greg Francis
Lecture 21

How to improve your memory without spending $20.

Memory

- We seem to be unable to control our memories
  - learn things we don’t want to remember
  - unable to learn things we want to remember
- Is there any reliable cue that something will be remembered?
  - no
  - but there are several tricks you can use to improve memory in certain situations

Encoding specificity

- We know that memory is best when study and test contexts are similar
  - For example, testing in the study classroom
- But variability in study promotes more general recall
  - Smith et al. (1978)
  - Subjects studied words twice: either in same context or different contexts (3 hour interval between contexts)

- Test subjects in a neutral context (after another 3 hour interval)
- Look at proportion correct recall
  - Highest with variable study contexts
- Advice: if you want to remember something in lots of contexts, study in lots of contexts

<table>
<thead>
<tr>
<th>Session 1 Learning context</th>
<th>Session 2 Context</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Classroom 1</td>
</tr>
<tr>
<td>Classroom 1</td>
<td>0.41</td>
</tr>
<tr>
<td>Classroom 2</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Study style

- Time spent studying is also “context” for memory retrieval
- Generally, more study leads to better memory
- Style of study matters too
  - distributed practice is better than massed practice
  - avoid cramming!
  - true for many skills

Level of processing

- Memory can be influenced by depth of processing at the time of study
  - Craik & Tulving (1975)
- Subjects observe words with associated tasks

<table>
<thead>
<tr>
<th>question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>In capital letters?</td>
<td>BOOK</td>
<td>book</td>
</tr>
<tr>
<td>Rhyme with thing?</td>
<td>sprint</td>
<td>sprint</td>
</tr>
<tr>
<td>Synonym for heavy?</td>
<td>bulky</td>
<td>brown</td>
</tr>
</tbody>
</table>
**Level of processing**
- Recall is better as depth of processing increases
  - More distinctive memories are created, which helps subsequent recall
  - By varying depth of processing, you can construct memories that are more likely to be recalled

**CogLab**
- Recall is better as depth of processing increases
  - “Test” is what matters here, other data is just for completeness
  - 175 participants

**Levels of Processing**
- Level of processing is more important than intent to learn (Hyde & Jenkins, 1973)
- 11 groups of subjects
  - 1 control group: told they will be tested to recall the words
  - not given any study task
  - 10 experimental groups split to perform a study task
    - Pleasant-unpleasant rating
    - Estimate frequency of word usage
    - E-G checking: does word contain an E or a G?
    - Identify part of speech: noun, verb, ...
    - Sentence framing: which sentence does word best fit in?
  - For all experimental groups, either
    - (a) Intentional learning: told they will be tested to recall the words
    - (b) Incidental learning: not told they will be tested

**Intention**
- Recall (out of 24 words) varies a lot with task
- Not much variation with intention to learn

**Implications**
- Advice: study interactively
  - read notes
  - rewrite notes
  - rephrase notes
  - teach someone else
- Importantly, people are not usually good at estimating whether something will be remembered

**Judgments of Learning**
  - Subjects study a pair of words (e.g., OCEAN – TREE)
  - Estimate how likely they are to be able to remember one word if shown the other (JOL).
    - Given OCEAN, how likely to remember the associated item later?
    - This is the subject’s estimate of their ability to use LTM
- Make judgment either
  - Immediately after studying the pair
  - Delayed to later in the experimental trials
- Note: students studying for an exam often use the immediate approach for a JOL to decide if they need to continue studying
Judgments of Learning
- Immediate JOLs do not match memory performance (at the end of the experiment)
  - Especially for high JOLs
- Delaying the JOL leads to fairly accurate JOLs
- Advice: study, wait, estimate learning

Practicing recall
- A common approach to studying is to use flash cards (or something similar)
- Two steps to studying
  1. Read material on both sides (study)
  2. Practice test the material (given one side, try to recall the information on the other side)
- What should you do when you successfully recall the information during the practice test?
  - Continue to study?
  - Continue to test?
  - Set aside and focus on other cards?

Practicing recall
- Karpicke & Roediger (2008)
- Subjects study 40 Swahili - English word pairs
  - mashua – boat
  - kaka – brother
- Test for English given Swahili:
  » mashua
- Four groups of subjects, that differ after an item is correctly recalled
  - ST (study-test): subject studies and continually tested over every pair
  - SnT (study on non-recalled - test on all): when a subject recalls a pair, it is no longer studied, but it continues to be tested
  - STn (study all, test only on non-recalled): when a subject recalls a pair, it continues to be studied, but it is not tested
  - SnTn (study on non-recalled, test on non-recalled): when a subject recalls a pair, it is not studied or tested again
- A week later, everyone is tested

Learning styles
- A common approach in education is to identify a student’s learning style and then teach for that style
- Lots of tests to identify a student’s learning style
- There do seem to be real differences in what style people indicate they prefer

Learning styles
- Unfortunately, there is absolutely no evidence that reported learning style preference has anything to do with learning
- Pashler et al. (2009) observed that to demonstrate evidence that learning style influenced learning, you have to show a particular kind of interaction of effect
**Learning styles**

- Pashler et al. (2009) then reviewed hundreds of studies purporting to show evidence for learning styles, but only ever found effects like these.
- But these only indicate an advantage for a type of learning or a method.

**Why is the idea popular?**

- It fits with the American ideal of everyone being capable of learning if given the chance (no child left behind).
- It allows parents (and students) to blame the educational system for failure rather than lack of motivation or ability.
- It lends itself well to statistical quirks of finding “just the right method” for a given student.
- It’s a generalization of the experience that a given student benefits from a new explanation of material.

**Conclusions**

- Lots of ways to improve memory
  - Encoding specificity
  - Level of processing
  - Judgments of Learning
  - Practice testing
  - Learning styles

**Next time**

- Mental imagery
- Sleep
- Brain training
- CogLab on Link Word due!

*Get a good night’s sleep!*