Memory discrimination

PSY 200
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Lecture 18

How to take a test.

Discrimination

- Many cognitive tasks require you to discriminate between events/stimuli
  - Is this a real smile?
  - Is this fruit ripe?
  - Is there a stapler on the desk?
- The same kind of discrimination is required for memory.

False memory

- An example list is smooth, bumpy, tough, road, sandpaper, jagged, ready, coarse, uneven, riders, rugged, sand, boards, ground, gravel
  - the special target is rough, which is not shown to the subject
- After viewing the list, the subject must go through a set of words and identify which ones were in the just seen list
  - some words were in the list
  - some words were not seen
    » including the special target

False memory

- The main finding is that the special target is often identified as part of the just seen list
  - even though it was not
- Sometimes people will even report that they recall "seeing" the special target
  - but this is impossible because it was never shown
- CogLab data (68 participants)
  - Type of selected items
    | Percentage of recalls |
    |-----------------------|
    | In original list       | 80.8 |
    | Normal distractor (not in list) | 7.2    |
    | Special distractor (not in list) | 69.9 |
- These types of findings suggest that our memories are
  - not necessarily accurate, we can remember things that never occurred
  - able to be manipulated, to a certain extent, I can make you have certain memories
- Why does the false memory effect happen?
False memory

- With every to-be-remembered item you store some information, but not only information about the item
- Other information is automatically generated as well
  - smooth, bumpy, tough, road, sandpaper, jagged, ready, coarse, uneven, riders, rugged, sand, boards, ground, gravel

At the end of the trial, you have a lot of items in memory that are related to the list
- Some of these items that were actually on the list and some of these items that were "generated" but not actually on the list
  - Reporting all items from memory is not going to lead to good performance
  - Both types of memory items are real, but only one type matches the physical stimuli
- Good performance on this task requires discrimination between memories generated by physical stimuli and memories generated by internal processes
  - Source monitoring

Discrimination

- Good memory recall usually requires not only recall of an item from memory
- You also must identify the correct item relative to the appropriate context or time frame
  - The current trial
  - The context of the experiment
  - Relative to an earlier event
  - At a particular moment in time

Interference

- Retroactive interference (RI)
  - new information prevents recall of previous information
    - e.g., Overwriting a computer file.
- Proactive interference (PI)
  - prior learning prohibits new learning
    - e.g., Learning new cultural customs.
  - May be due to a variety of effects
    - One is that memory involves discriminating new from old
      - Visual memory
        - See a set of photos
        - Then see a test photo and decide if new or old
      - In general, previous trials make memory discrimination more challenging
Proactive interference
- One finds proactive interference for lots of memory tasks
- CogLab serial position experiment
  - I looked at recall of the first letter in each list, averaged across all students

![Graph showing Proportion of items first recalled over trials.]

Proactive interference
- One finds proactive interference for lots of memory tasks
- False memory experiment
  - I looked at recall identification of the normal words in the list

![Graph showing Average number of words recognized.]

Proactive interference
- Inference does not happen for all experiments
  - Just those related to memory
- Partial report experiment (first 12 trials had the cue before the letter matrix – to give you practice)

![Graph showing Proportion of letters reported over trials.]

Release from PI
- Proactive interference weakens for different stimulus types
- Run two Brown-Peterson type experiments

<table>
<thead>
<tr>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>XJF</td>
<td>Trial 1</td>
</tr>
<tr>
<td>WRM</td>
<td>Trial 2</td>
</tr>
<tr>
<td>DBL</td>
<td>Trial 3</td>
</tr>
<tr>
<td>NRX</td>
<td>Trial 4</td>
</tr>
</tbody>
</table>

![Graph showing Percentage correct over trials for Control and Experimental groups.]

Release from PI
- Trials 1-3 show build up of PI
- Experimental group shows release of PI on Trial 4

![Graph showing Percentage correct over trials for Control and Experimental groups.]

Release from PI
- Works for many kinds of memory tasks
- Many kinds of stimuli

5, 7, 9, 1 vs NICE, SUNNY, ENJOY, PUPPY
5, 7, 9, HAND vs NICE, SUNNY, ENJOY, KILL

D, D, D, D vs D, D, D, F
Memory system
- Every memory system must have at least two components/processes
  - Storage
  - Retrieval
- We have described proactive interference as being due to difficulty discriminating new items from previous items
- But there is an alternative explanation
  - Proactive interference might prevent items from being stored and thereby make them unrecallable

Working memory
- For example, working memory has a storage interference hypothesis for the phonological loop
- Working memory suggests that interference can occur
  - by blocking ACP rehearsal (articulatory suppression, Brown-Peterson task, word length effect)
  - within the P0 when items sound similar
  - both of these block the storage of items (items fall out of the loop)

Testing models
- Test location of PI by changing instructions after the list is presented
- Experiment
  - stimuli are names of indoor and outdoor games
  - subjects usually do not notice that word on the fourth trial is an indoor game and others are outdoor games
- Take two groups of subjects
  - one has traditional PI type experiment
  - one is told of difference on fourth trial, at the time of test

Interference at recall
- If PI prevented the last item from being stored your telling a subject that the fourth item was an indoor sport, should make no difference (other than guessing)
  - but it makes a big difference, they show release from PI

How to take a test
- Avoid PI
- Answering successive questions on the same topic hurts recall
  - after answering unrelated questions
  - go back to questions you cannot answer
  - less proactive interference
  - should recall more

Conclusions
- Discrimination
- Retroactive interference
- Proactive interference
- Release from PI
- Strong effects
- Knowing about can help in everyday tasks
Next time

- Constructive memory
- Flashbulb memories
- Memory misattribution
- Misleading questions

- *How good is eye-witness testimony?*