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
- 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 (163 participants)
  - Type of selected items | Percentage of recalls
    - In original list | 78.5
    - Normal distractor (not in list) | 7.9
    - Special distractor (not in list) | 78.5

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 them are items that were actually on the list and some of them are 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.

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.

Proactive interference

- 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

Suppose you see this building as the test on the third trial.
- You have a match in memory, but it is from trial 1, not trial 3.
- You may report it having been shown in trial 3.
- In general, previous trials make memory discrimination more challenging.
Proactive interference
- One finds proactive interference for lots of memory tasks
- CogLab serial position experiment
  - Proportion of errors first letter in each list, averaged across all students

Inference does not happen for all experiments
- Part related to memory

Partial report experiment (first 12 trials had the cue before the letter matrix – to give you practice)

Proactive interference
- One finds proactive interference for lots of memory tasks
- False memory experiment
  - Proportion of identification of the normal words in the list

Proactive interference
- Inference does not happen for all experiments
  - Just those related to memory
- Attentional Blink experiment (detection of the first letter in the stream)

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>XJF</td>
</tr>
<tr>
<td>WRM</td>
<td>WRM</td>
</tr>
<tr>
<td>DBL</td>
<td>DBL</td>
</tr>
<tr>
<td>NRX</td>
<td>Trial 4</td>
</tr>
</tbody>
</table>

Release from PI
- Trials 1-3 show build up of PI
- Experimental group shows release of PI on Trial 4
Release from PI
- Works for many kinds of memory tasks
- Many kinds of stimuli

<table>
<thead>
<tr>
<th>5, 7, 9, 1 vs 5, 7, 9, HAND</th>
<th>NICE, SUNNY, ENJOY, PUPPY vs NICE, SUNNY, ENJOY, KILL</th>
</tr>
</thead>
</table>

News stories

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 PS when items sound similar (phonological similarity effect)
  - both of these interference types block the storage of items (items fall out of the loop)

Testing models
- Test storage vs. recall 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?