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 the stapler on the desk?
- The same kind of discrimination is required for memory

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 (153 participants)
  - Type of selected items | Percentage of recalls
  - Original list | 75.7
  - Normal distractor (not in list) | 5.9
  - Special distractor (not in list) | 67.3
- 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, road, tough, 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.
- 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.

**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
  - I looked at recall of the first letter in each list, averaged across all students

![Proactive interference graph]

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>
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<tr>
<td>942</td>
<td></td>
</tr>
</tbody>
</table>

![Release from PI graph]

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
  - both of these block the storage of items (items fall out of the loop)

![Working memory graph]
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.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Stimuli</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FOOTBALL</td>
</tr>
<tr>
<td>2</td>
<td>SOCCER</td>
</tr>
<tr>
<td>3</td>
<td>BASEBALL</td>
</tr>
<tr>
<td>4</td>
<td>WALLYBALL</td>
</tr>
</tbody>
</table>

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.

| ACT    | T1, T1, T1, T1 vs T1, T1, T1, T2 |

Long-long term memory

- Bahrick et al (1975)
- 392 subjects brought in their high school yearbook.
  - Asked to match names with faces.
  - Or recall names for faces.

Discrimination

- One can suggest at least two explanations for poorer memory as time elapses:
  1) Retroactive interference from subsequent faces/names.
  2) The mental representation of temporal position becomes blurred as a function of time.
  - Recent events are easy to discriminate in time.
  - Long ago events are difficult to discriminate in time.
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?