Prof. Greg Francis 7/31/23

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







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Discrimination

- · Discrimination is difficult because memories can come from lots of different sources
- · Consider so-called "False memory" studies
 - as in CogLab
 - subject views a list of words
 - the list of words have something in common
 - » they are all related to a target word



False memory

An example list is

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- smooth, bumpy, tough, road, sandpaper, jagged, ready, coarse, uneven, riders, rugged, sand, boards, ground,
- 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



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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 (163 participants)

 Type of selected items Percentage of recalls

• In original list • Normal distractor (not in list) 7.9

• Special distractor (not in list)

False memory

- 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?



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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

smooth rough baby





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False memory

- . 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

jagged Sto bumpy smooth peal tough sandpaper hails gravel road

Memory

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

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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.

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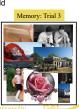
Proactive interference

- 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



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Proactive interference

- Suppose you see this building as the test on the third trial
 - You have a match in memory, but 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



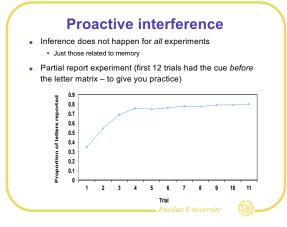




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Proactive interference One finds proactive interference for lots of memory tasks CogLab serial position experiment I looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first letter in each list, averaged across all students Is a looked at recall of the first lett

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Release from PI • Proactive interference weakens for different stimulus types • Run two Brown-Peterson type experiments Control Experimental XJF Trial 1 XJF WRM WRM Trial 2 DBL Trial 3 DBL NRX Trial 4 942

Release from PI

Trials 1-3 show build up of PI

Experimental group shows release of PI on Trial 4

Trial 4

Trial 4

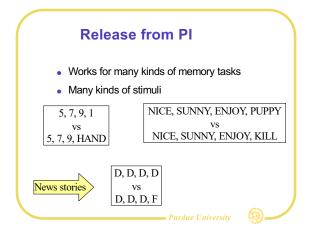
Trial 3

Trial 4

17 18

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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

Testing models



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Working memory

- · For example, working memory has a storage interference hypothesis for the phonological loop
- · Working memory suggests that interference can Visual
 - 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)



the time of test

Experiment

• one has traditional PI type experiment • one is told of difference on fourth trial, at

subjects usually do not notice that word

others are outdoor games

· Take two groups of subjects

on the fourth trial is an indoor game and

Test storage vs. recall of PI by changing

• stimuli are names of indoor and outdoor Trial 1

instructions after the list is presented

Trial 2

Trial 3

FOOTBALL

BASEBALL

SOCCER

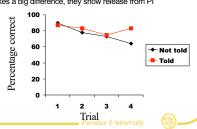
Trial 4 ★ WALLYBALL

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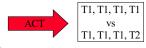
Interference at recall

- 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





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Conclusions

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

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Next time

- Constructive memory
- Flashbulb memories
- Memory misattribution
- Misleading questions
- How good is eye-witness testimony?

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