Announcements
- Grade Query Tool Updated with
  - Exam Scores
  - Aplia Scores
  - Cumulative scores and comparison to class
- Chapter 7 Aplia due Wednesday

Memory

DEMO!!!

Listen to this list…

Which of the following was on the list?
A. Nurse
B. Crib
C. Office
D. None of the above

Which of the following was on the list?
A. Mountain
B. Cougar
C. Run
D. None of the above
Which of the following was on the list?

A. Music
B. Doctor
C. Bird
D. None of the above

Here is the list...

Nurse    Physician
Sick     Ill
Lawyer   Patient
Medicine Office
Health   Stethoscope
Hospital Surgeon
Dentist  Clinic
Dentist  Cure

I. Overview & misconceptions

- Memory is NOT a videotape or TiVo!
- Memory not like a “muscle”
- No one spot for memories in the brain

II. Ways to conceptualize memory

A. Structural categorizations
   1. By length of time material stays in memory
      a. Sensory Store
      b. Short-Term Memory (working memory)
      c. Long-Term Memory

B. Stage of processing
   1. Encoding
   2. Storage
   3. Retrieval
Stage of Processing Model
(Atkinson-Shiffrin Model)

- Sensory Input
- Sensory Store
- Working or Short-term Memory
- Long-term Memory

Stage of Processing Model
- Capacity - large
  - can hold many items at once
- Duration - very brief retention of images
  - .3 sec for visual info (iconic)
  - 2 sec for auditory info (echoic)

Demo of Iconic Memory

Now, Partial Report...

Now imagine...
- You don’t know what letter you’ll have to look for ahead of time
- After the display darkens, a cue comes on after some variable delay, telling you what letter you’re searching for
- During delay, iconic memory fades

Graph: Number of letters available versus time. The number of letters available for the partial-report condition decreases with delay of the cue tone.
Short Term Memory

- Function - conscious processing of information
- where information is actively worked on
- Capacity - limited (holds 7 +/- 2 items)
- Duration - brief storage (about 30 seconds)

Working Memory Store

What happens if you need to keep information in working memory longer than 30 seconds?
To demonstrate, memorize the following phone number (presented one digit at a time)...

WAIT 30 seconds

OK!

What is the number?

A. 859-7619
B. 857-9163
C. 897-5163
D. 857-3691

Short Term Memory: Maintained by Active Rehearsal

Mental or verbal repetition of information
Allows information to remain in working memory longer than the usual 30 seconds

The number lasted in your working memory longer than 30 seconds
So, how were you able to remember the number?
Tricks to beat 7 +/- 2

- Repetition (so so, but challenging)
- Chunking!!!
- Try it!

5-2-0-3-0-8-7-1-2-8

Interference with STM

- If distracted, contents of STM gone
- Let’s try it!

Listen...

Did you remember the word Apple
A. Yes
B. No
Did you remember the word Silver
A. Yes
B. No

Did you remember the word Music
A. Yes
B. No

Apple Star Fog Paper Book Bicycle Pencil Silver Night Purple Mountain Baby Sheep Music Doctor

III. Memory systems based upon time material stays in memory
A. Sensory Store: iconic, echoic
B. Short-Term Memory (STM)
   1. Interference & Maintenance rehearsal
   2. Serial position effects
C. Long term Memory (LTM):
   1. Only a subset of information that makes it to STM actually gets transferred into LTM
   2. Interference
      a. Retroactive interference – can’t retrieve earlier material
      b. Proactive interference – Prevents new learning
Examples

- Retroactive:
  - Cannot recall old phone number after you obtained new number
  - Cannot retrieve previously-learned language after more recently learning another language
- Proactive:
  - Cannot recall your new flame’s name but keep bringing to mind your former flame’s name
  - Cannot recall where you parked your car today but do remember where you parked it yesterday

IV. By type of information

A. Episodic
B. Semantic
C. Procedural

IV. By type of information

A. Episodic: memory for events
1. Detailed recollections with story-like quality, place, time, self
2. Disrupted in amnesias from many causes:
   A. Head Injuries
   B. Hypoxia
   C. Dementing Illness (e.g. Alzheimer’s)

IV. By type of information

B. Semantic: Less often forgotten in amnesias
C. Procedural
1. Learn a skill; resilient to forgetting
2. Preserved in many forms of amnesia
3. Example

By type of information

D. Alternatively, explicit, implicit;
1. Incidental vs intentional learning
2. Dissociation of Explicit and Implicit Memory in Amnesia
Paired Associate Learning Task

- Word Pairs learned:
  MOTEL-ABSENCE

- Later tested explicitly (recall) or implicitly:
  MOTEL-ABS_____

- Only explicit recall impaired in many forms of amnesia

V. Stage of Processing Model

V. Stage of Processing

A. Encoding: getting information into memory
   1. What is encoded – significant stuff!
   2. Contextual cues
   3. Mood/state dependent memory is result of contextual cues

If the balloons popped, the sound wouldn't be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying, since most buildings tend to be well insulated. Since the whole operation depends on a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course, the fellow could shout, but the human voice is not loud enough to carry that far. An additional problem is that a string could break on the instrument. Then there could be no accompaniment to the message. It is clear that the best situation would involve less distance. Then there would be fewer potential problems. With face to face contact, the least number of things could go wrong.
Now what do you recall?

V. Stage of processing

B. Storage – not a secure vault!
1. ECT disrupts
2. Memories can change after storage!

Loftus Experiment

- Subjects shown video of an accident between two cars
- Some subjects asked: How fast were the cars going when they smashed into each other?
- Others asked: How fast were the cars going when they hit each other?

Memory Construction Elizabeth Loftus’ classic experiment

Eyewitnesses reconstruct memories when questioned

Loftus’s Results

- Speed estimates depended on how the question was phrased
- Subject’s memory for broken glass also depended on the phrasing of the speed question.
   - But this was a false memory: there was no broken glass

<table>
<thead>
<tr>
<th>Word Used in Question</th>
<th>Average Speed Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>smashed</td>
<td>41 m.p.h.</td>
</tr>
<tr>
<td>collided</td>
<td>39 m.p.h.</td>
</tr>
<tr>
<td>burned</td>
<td>38 m.p.h.</td>
</tr>
<tr>
<td>hit</td>
<td>34 m.p.h.</td>
</tr>
<tr>
<td>contacted</td>
<td>33 m.p.h.</td>
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</tbody>
</table>