CS 352
Introduction to Usability Engineering

Memory

Cognition

- What goes on in our heads when we perform tasks?
- From the book:
  - Attention, perception, memory, learning
  - Speaking, reading, listening
  - Problem-solving, reasoning

Thought Exercise

- Try this:
- Memorize this number:
  - 347 901 331 7347 89
- After you have it memorized go to the next slide
- <pause>

Thought Exercise (cont)

This part works best if you record yourself or have someone listen to you

- Say aloud the number you memorized
  - Say it 2-3 times
- Go to the next slide

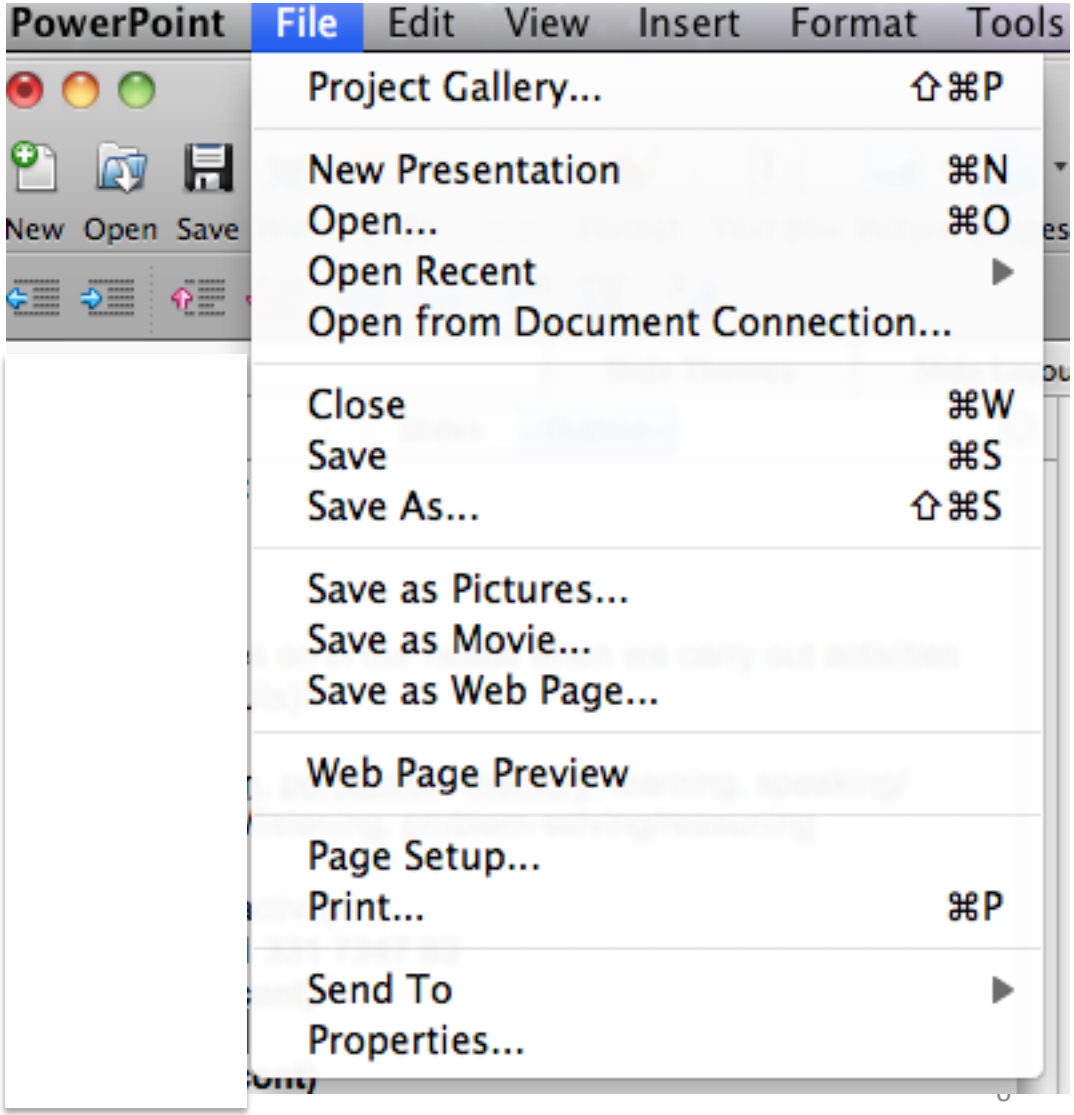
Thought Exercise (cont)

- Play it back
  - What did it sound like?
  - Something like this?

347 901 331 7347 89

Chunking

- UIs use this:



Thought Exercise

- Try this new problem:
- Memorize this number:
  - 134 790 133 1734 789
- After you have it memorized go to the next slide
- <pause>

Thought Exercise (cont)

This part works best if you record yourself or have someone listen to you

- Say aloud the number you memorized
  - Say it 2-3 times
- Go to the next slide

Thought Exercise (cont)

- Play it back
  - What did it sound like?
  - Something like this?

Thought Exercise (cont)

- Here's something to consider…
  - Some of you did this very fast
  - Why?

347 901 331 7347 89

134 790 133 1734 789

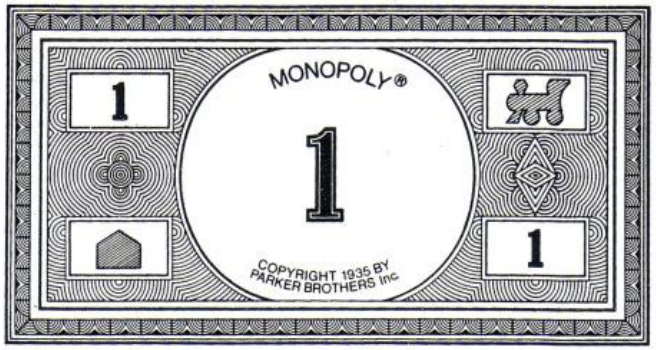
Structure of Memory

- Short term memory (STM)
- Long Term Memory

- When we say memory we mostly mean LTM

Recognition and Recall

- Recall
  - Draw a dollar bill
- Recognition



Recognition and Recall

- GUI strength: emphasize recognition over recall
  - But people are usually slowed down by need for visual scans in GUIs

People Storing/Retrieving Knowledge

- Declarative knowledge
  - NYC is north of Miami
  - To remove car key transmission must be in Park
  - Easy to teach
- Procedural knowledge
  - How to spin a basketball on 1 finger
  - How to boot smart phone in recovery mode
  - Best taught by demo, learned by practice

Encoding

- How we encode affects:
  - What we retrieve (recall or recognize) and
  - How we retrieve
  - Did you recognize the dollar bill easily?
  - Maybe not if you were raised in another country

Ways to Encode (and constraints)

- Appearance attributes, sound, rhythm, rhyme.
- Travelling performers: how do they do that?
  - Thru encoding tied to constraints
    - Rhythm
    - Rhymes
    - That make sense!
  - Example: The Raven

Constraints

- Reduce and/or facilitate encoding
  - Constraints reduce encoding needed
  - Support external cognition to remove need to encode
    - e.g. Excel's arrows make dependencies explicit
  - Provide users a variety of ways to encode (color, flagging, position)
    - e.g. forgot filename, but it is the red folder

Case Study

- Rearranging items based on recency
  - Think about chunking/grouping
  - Think about the imprecision of encoding
  - What will you do if don't see what you want?
- Does this mean most recent is always bad for UI?

Encoding

- Different amount of encoding needed for:
  - Remember a bunch of arbitrary things
  - Remember things with meaningful relationships
    - North Shore is on the north side
  - Remembering things that can be derived
    - Tied to mental models (coming soon!)

Implications for Your Project

- How can a UI help user remember?
  - Think about: recognition/recall, practice, chunking, declarative/procedural, encoding, constraints
- Ideas-
  - Grocery system content; what brand did I buy last time?
  - Grocery system UI mechanism; how do I get a subtotal
- Discussion activity: your project and memory