SI 388 Memory Retention & Retrieval

WEEK 9-1 (MON 30 OCT)

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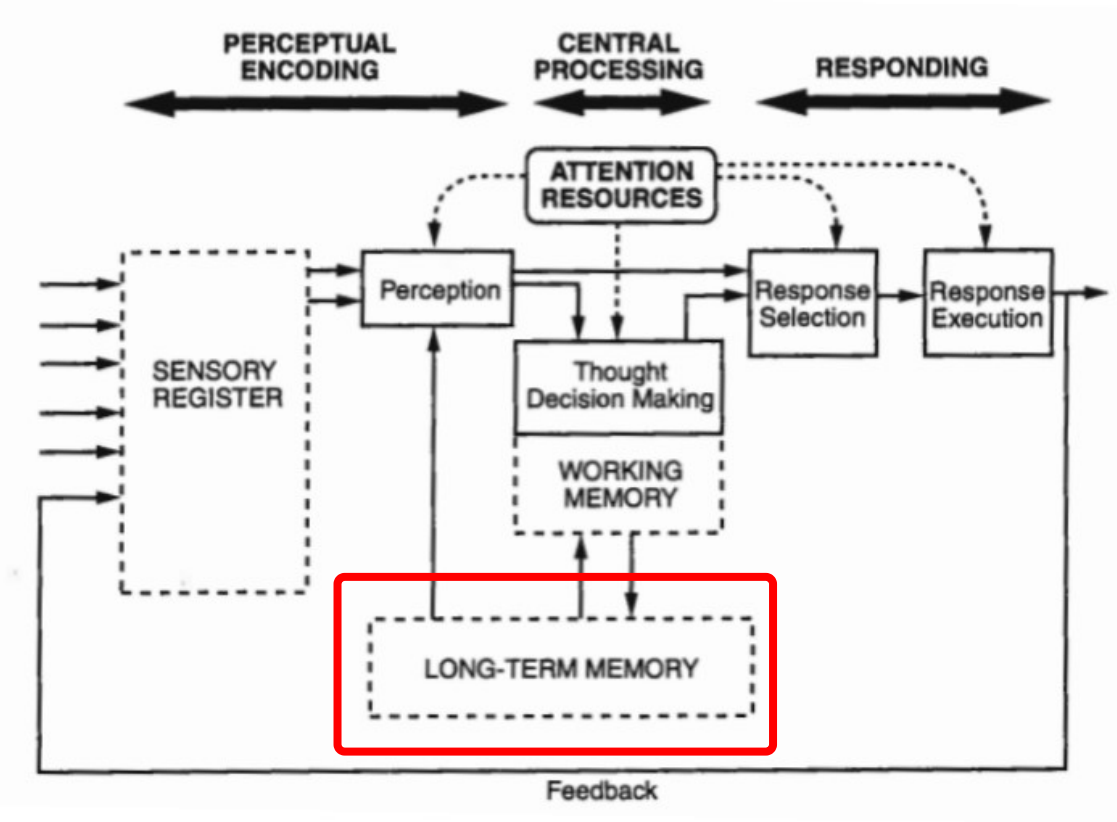
Agenda for Today

- TAC presentations by Groups 11 & 12
  - Feedback links in Announcements
- Wrap up / High points on Long-term Memory
- Lesson: Mental representations and problem solving

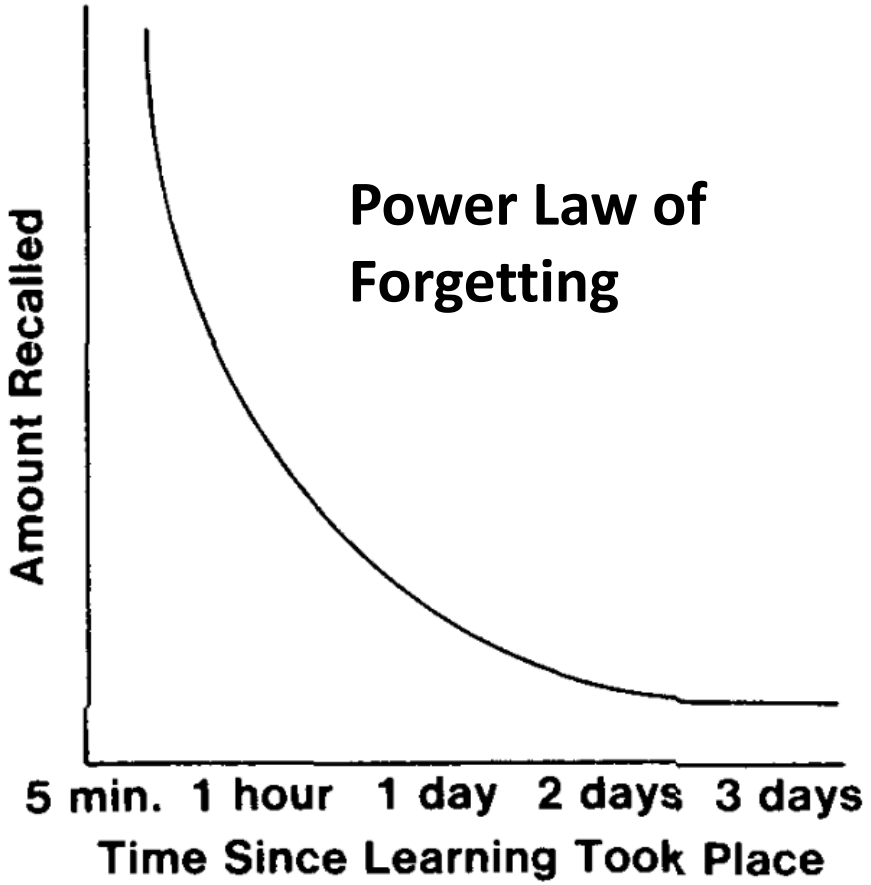
Wrap-up on Long-term Memory

- More on Long-term Memory
  - Factors in forgetting
  - Recall vs. recognition
  - Several implications on design



How Memory Retention Works: Time

- Memory systematically degrades with time (**Decay theory of forgetting**).
- What can be recalled from LTM drops off quickly and then rate of change decreases
- Follows a logarithmic function called **Power Law of Forgetting**
- Curve varies by:
  - Type of information
  - Strength of original memories
  - Emotional component



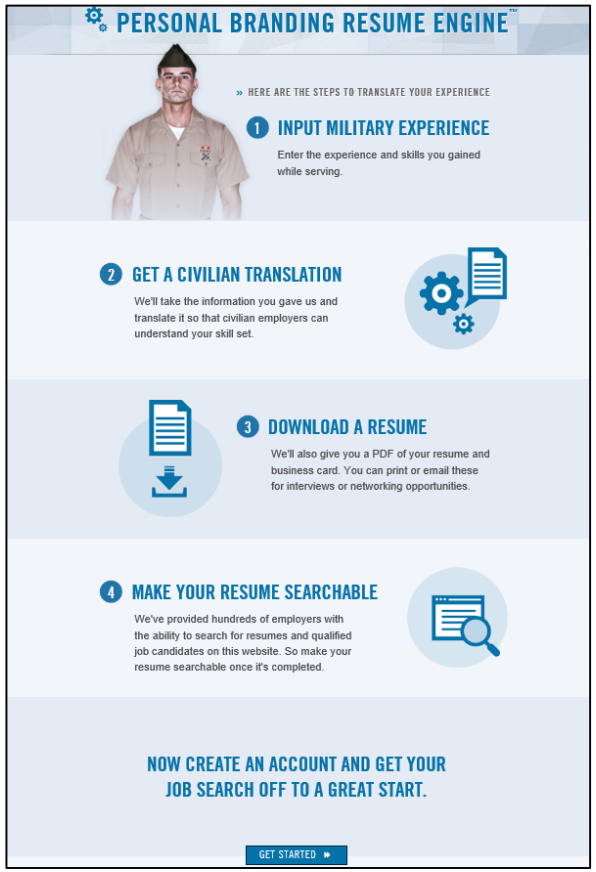
How Retention Works: Interference

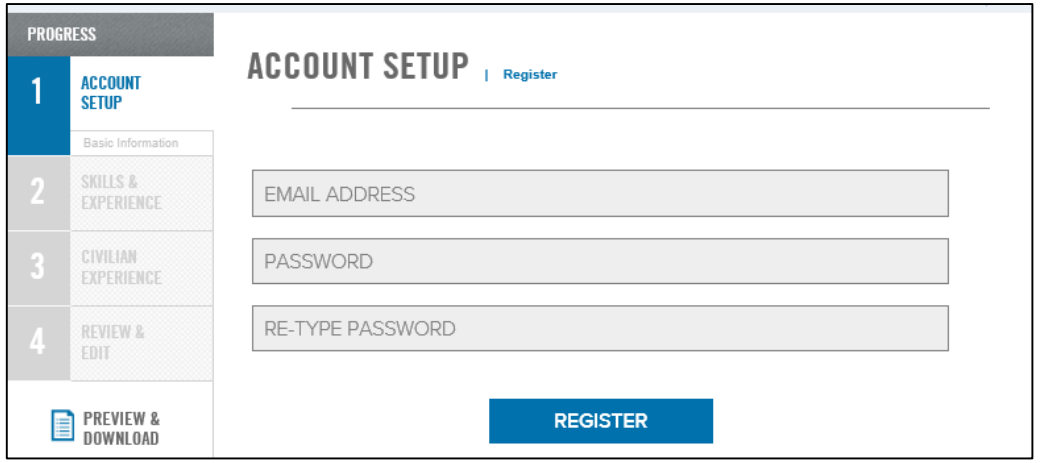
- Interfering material can degrade memory retention.
- Commonly called **Interference**.
- People experience information … then other, similar information → blurs together.

Redundancy Reduces Interference

- Interference is **decreased** when additional, related information is supplied with the initial information.

Has impacts in training/onboarding, where it's effective to provide multiple similar messages.

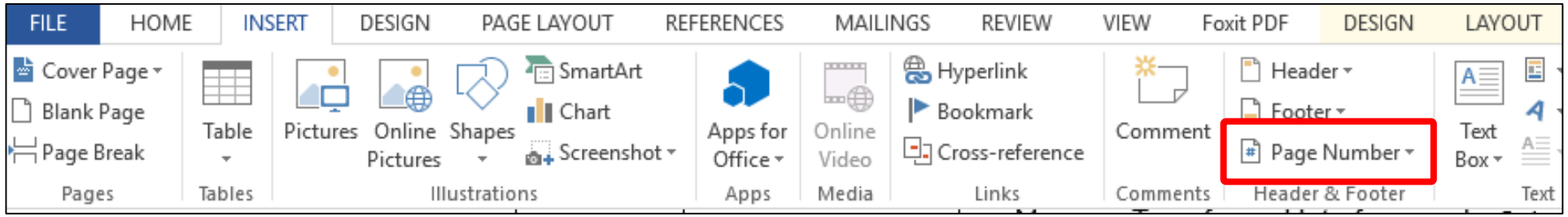




This site provides a preview screen for what the steps are.
Then there is a progress indicator that offers similar info.
Repetition helps <u>reduce</u> Interference.

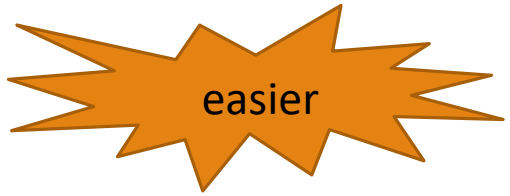
How Retention Works: Interference

- Pre-existing memories also can cause Interference.
- Previous similar procedural memories can supplant newly remembered info.



Recognition, Recall, and Retrieval

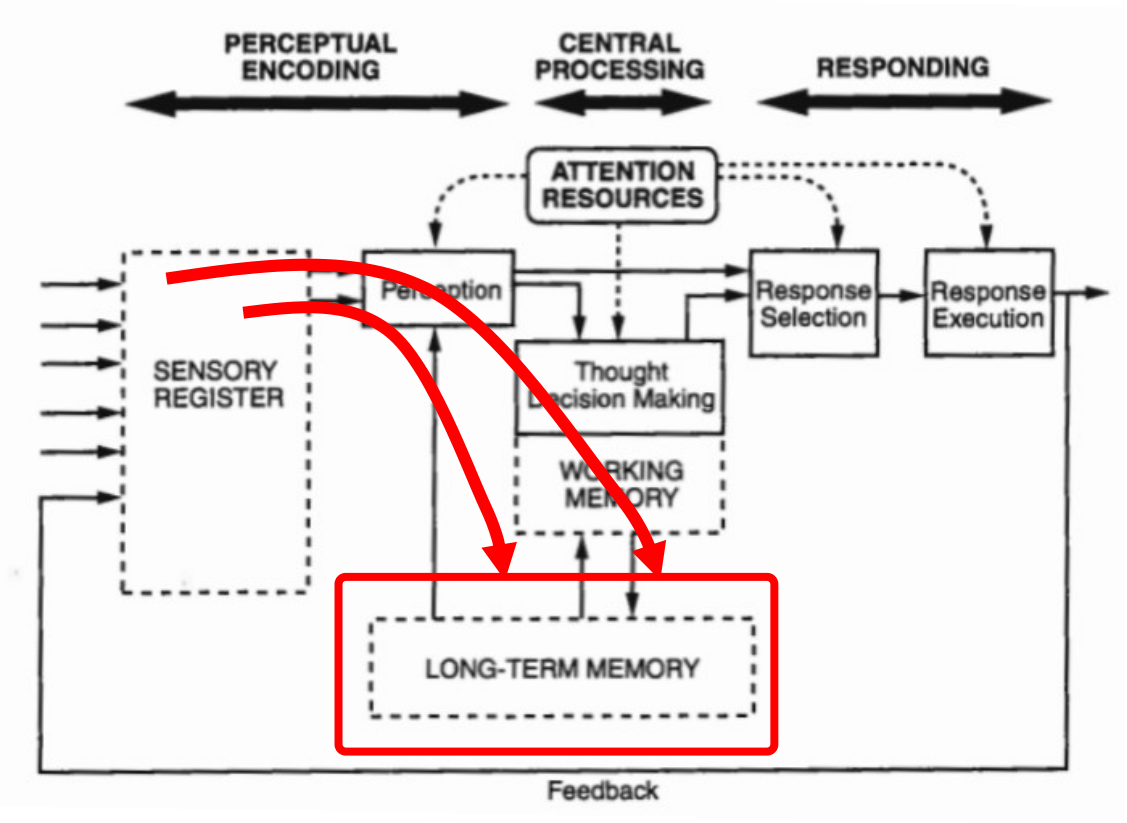
- **Recognition** = fast; based on familiarity and perception



- **Recall** = typically slower; deeper retrieval process

Why is Recognition So Much Easier?

- Perception is processed → patterns of neural activity are created
- When a new perception arrives similar to an earlier one, it re-stimulates the existing pattern without processing by Working Memory => sense of recognition



Recall Seems Harder, but We Do OK

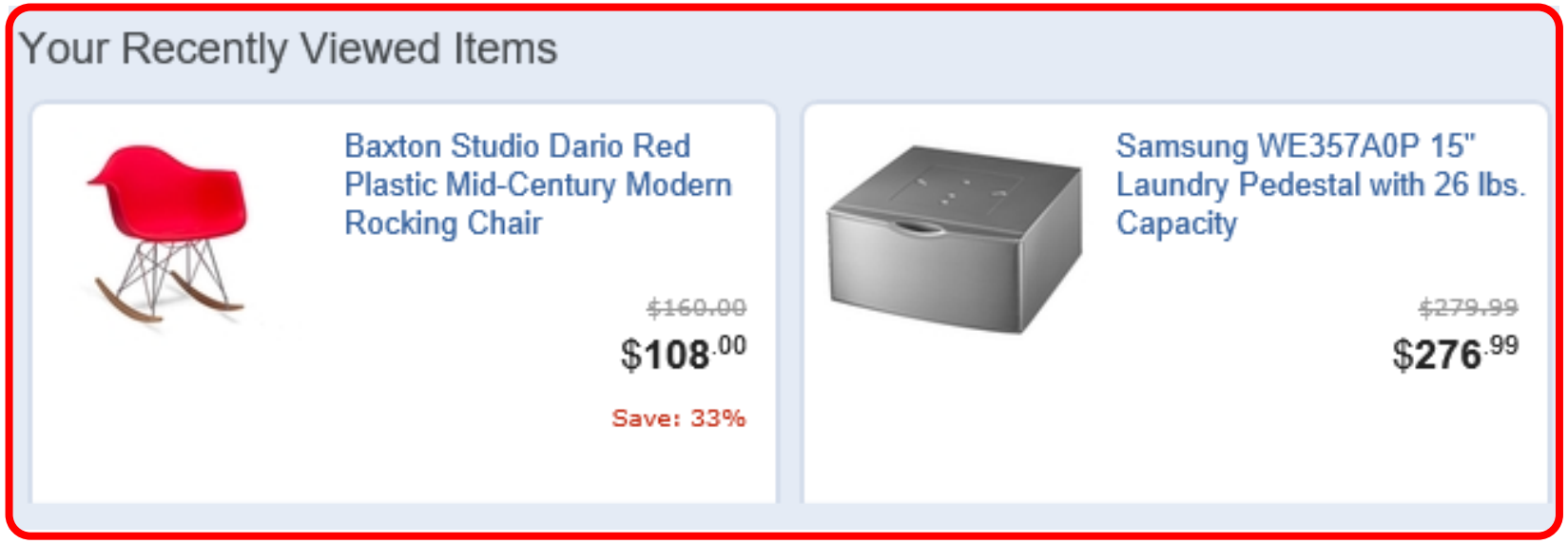
- Recall requires accessing memories **without** immediately similar perceptions
- We store a vast amount of information—1 million gigabytes—so recalling anything is kind of astonishing

(Reber, P. 2010. www.scientificamerican.com /article/what-is-the-memory-capacity)

Implications of Recognition for Design

Reminder images and text provide recognition, and are easier to process than recall is.

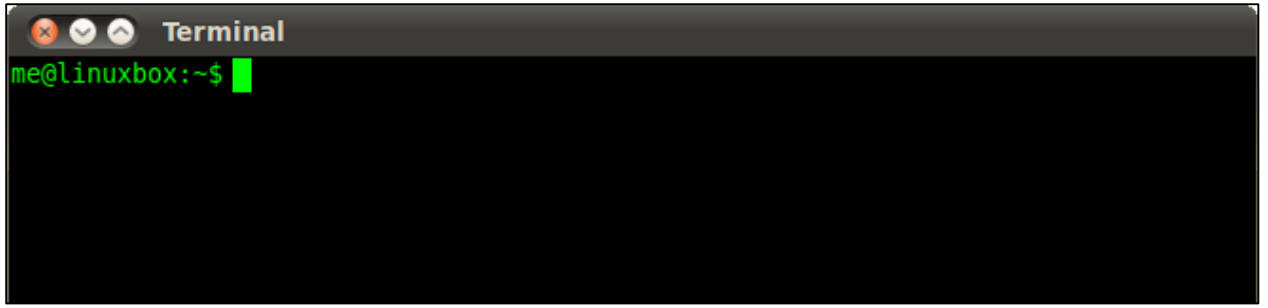
*Include **Recently Viewed Items functionality** often and creatively*

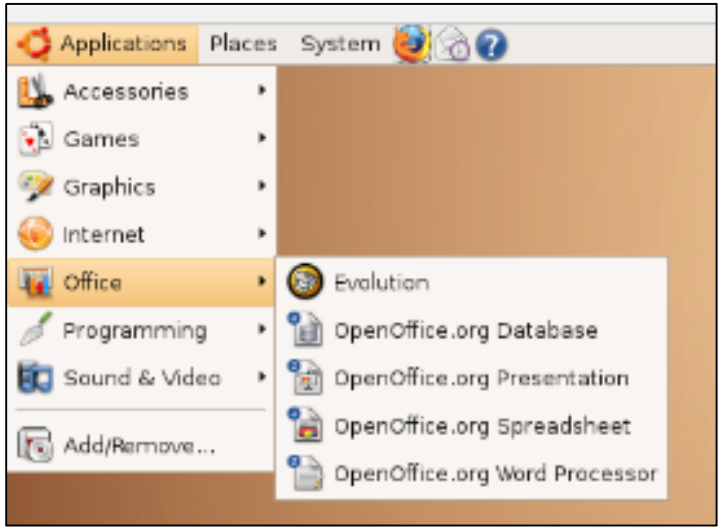


Implications of Recognition for Design

- Avoid instances of pure recall in favor of recognition.

Use menus over command lines

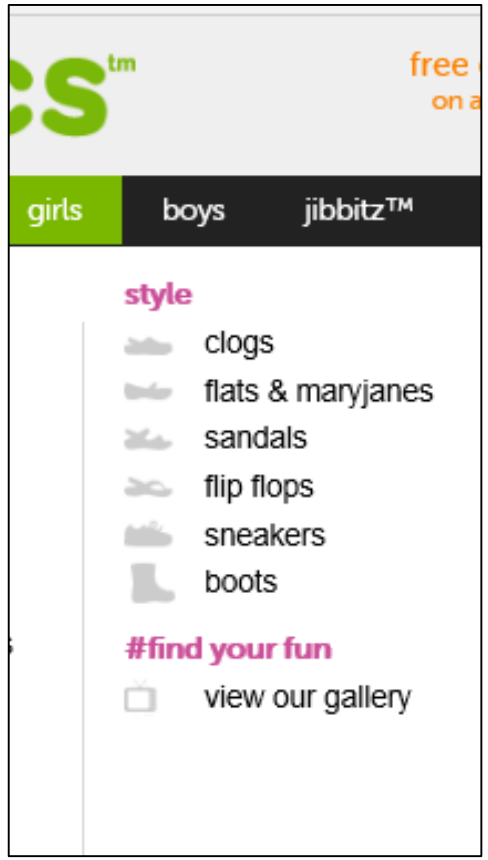




Implications of Recognition for Design

- Use pictures or icons for functions, (along with text labels).

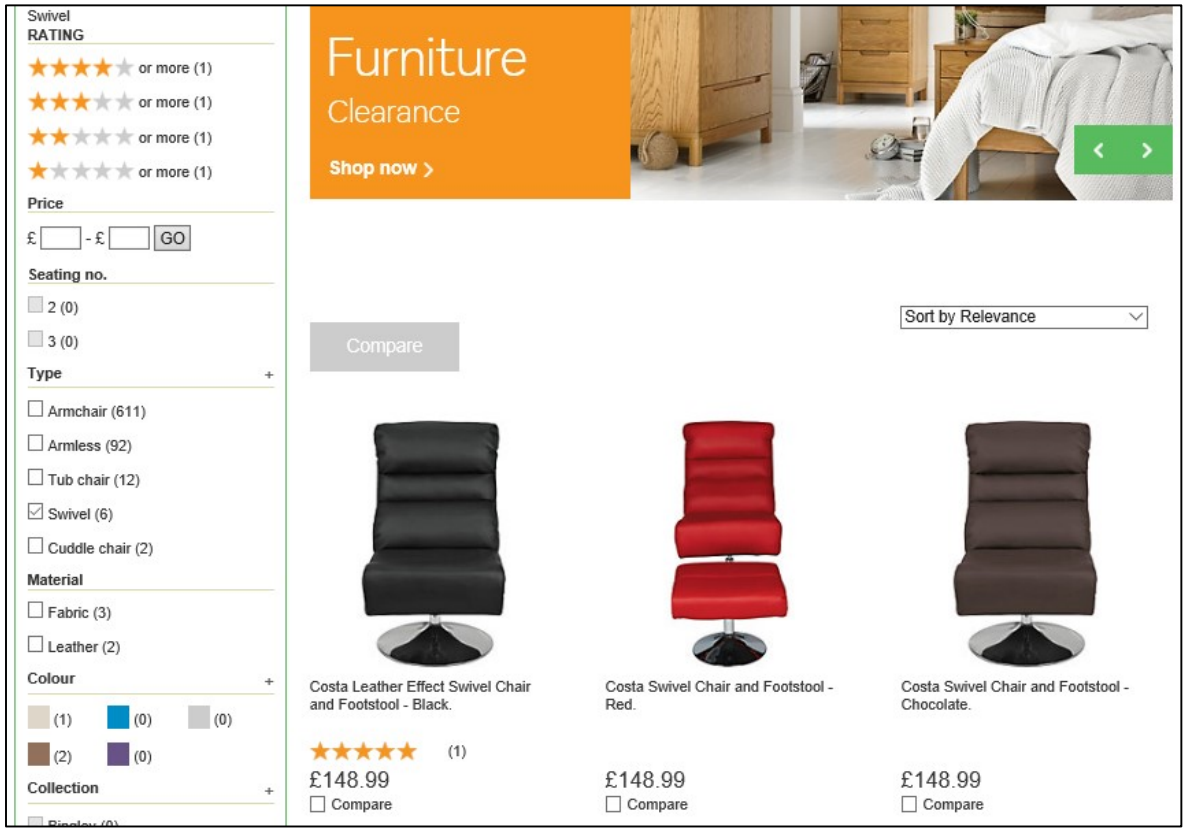
Make sure they're easy to differentiate and understand.



Implications of Recognition for Design

- Leverage smaller "thumbnail" images to help people navigate.

Provide images at a sufficient size so people can easily 'read' them on product listing pages, confirmation pages, shopping carts, and Support pages.

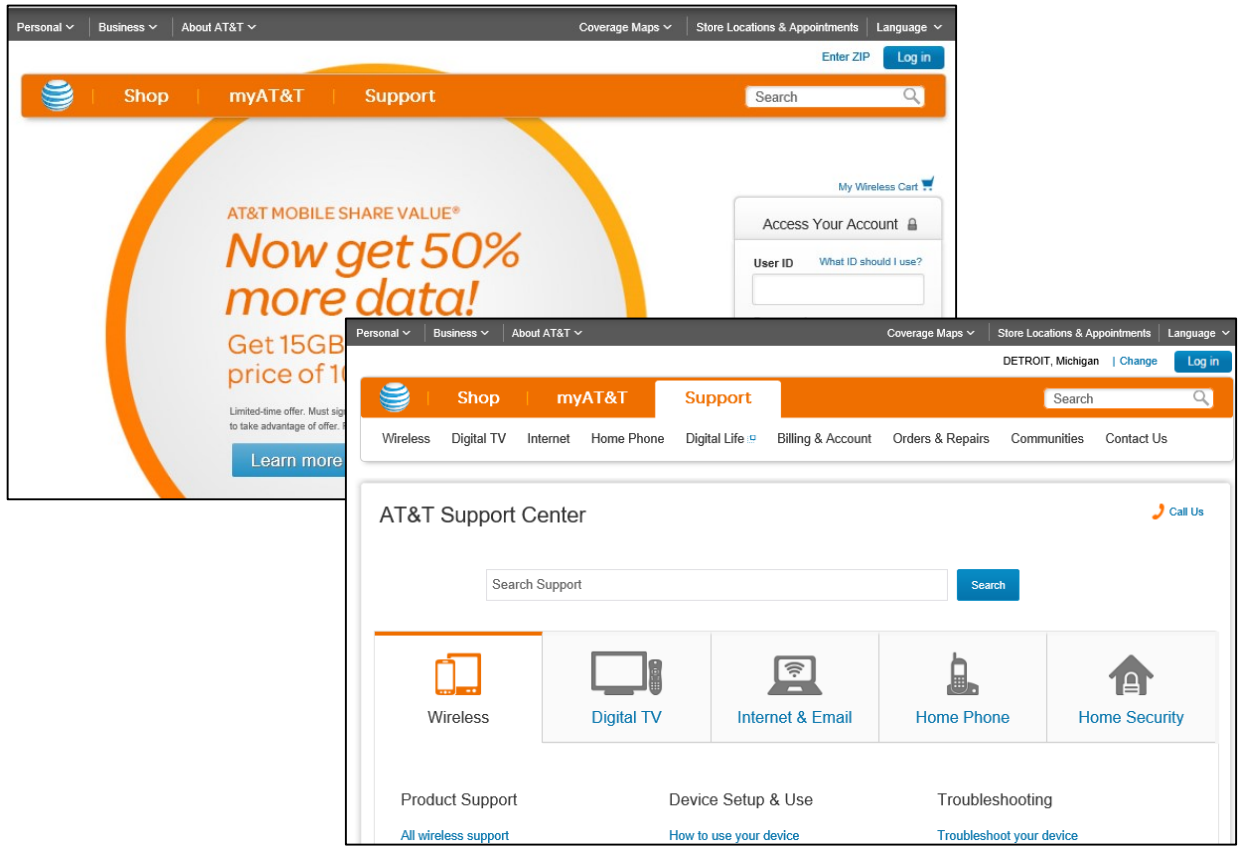


Implications of Recognition for Design

- Reassure people they are still on your site – or that they have returned to the right one.

Maintain consistent look and feel and navigation options, so it's all visually familiar.

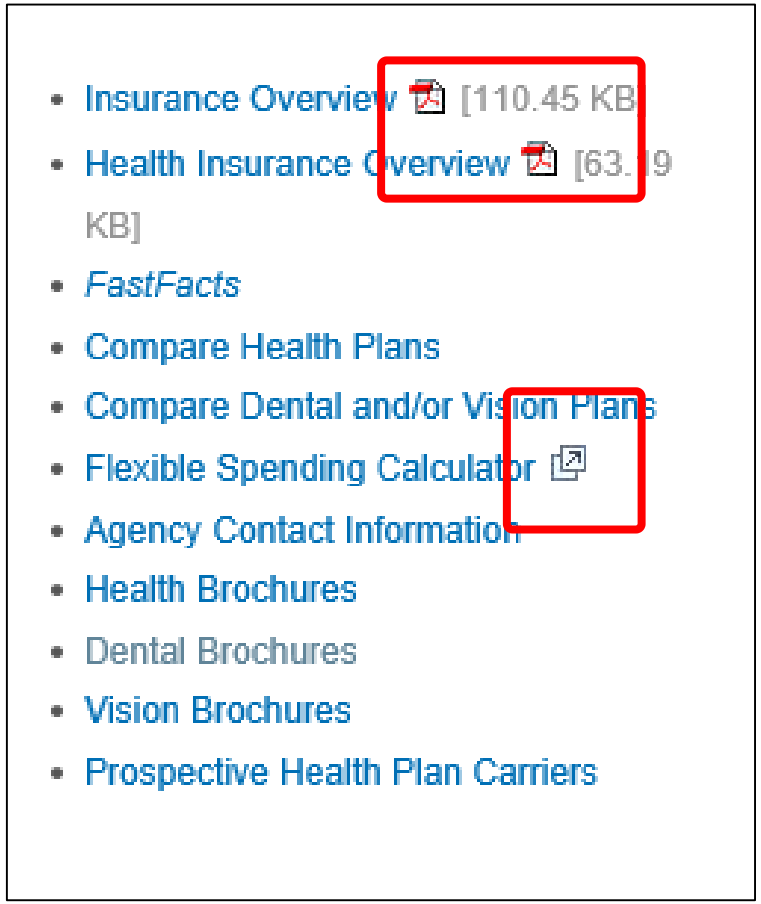
And…



Implications of Recognition for Design

- Give them some **conventional** forewarning icon if a link is going to take them to a:
  - Different site or
  - Open a PDF or some other kind of file.

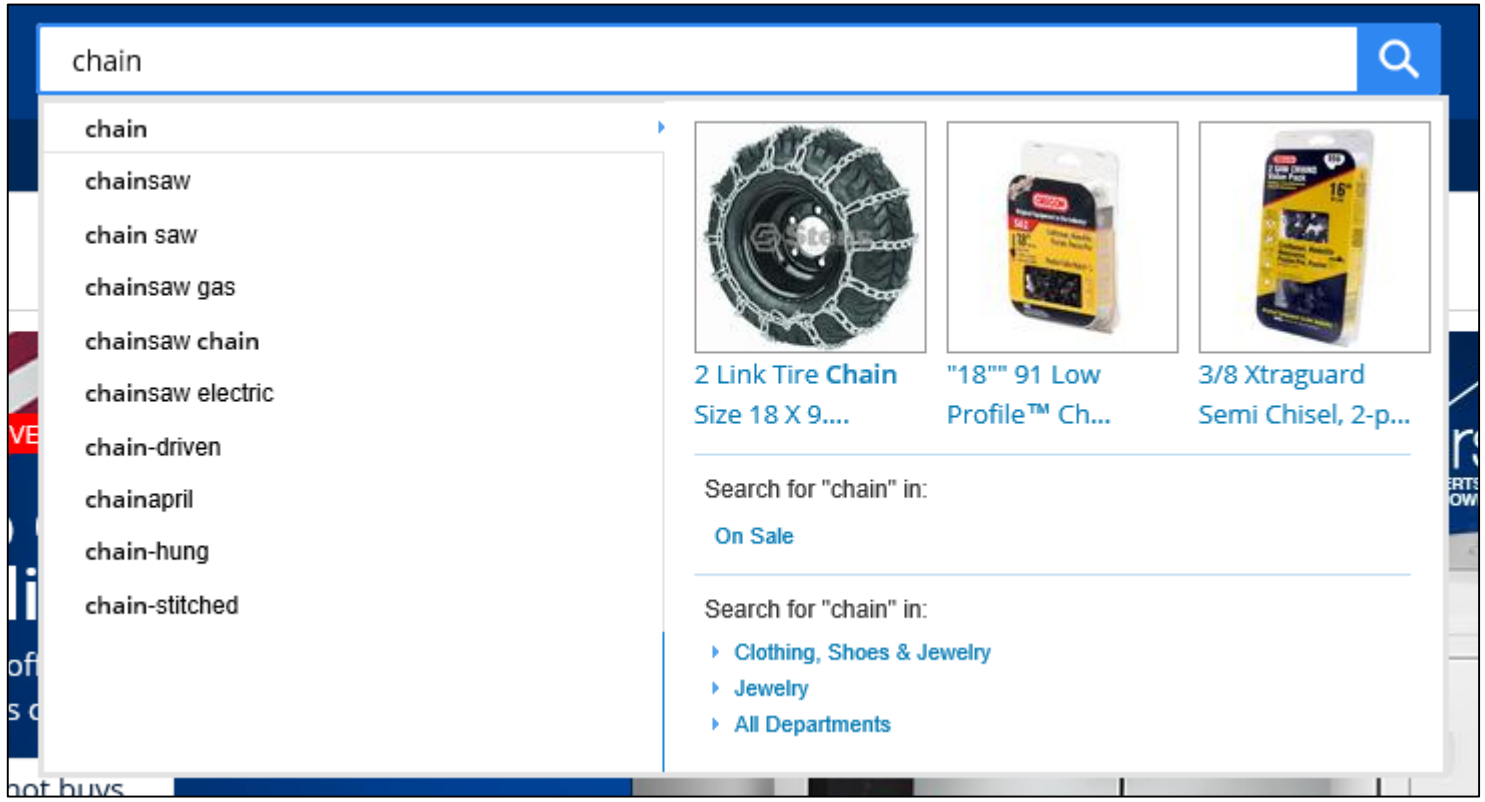
Also! Display icons and/or the new URL with the link, so there isn't a jarring arrival on a different site.



Implications of Recognition for Design

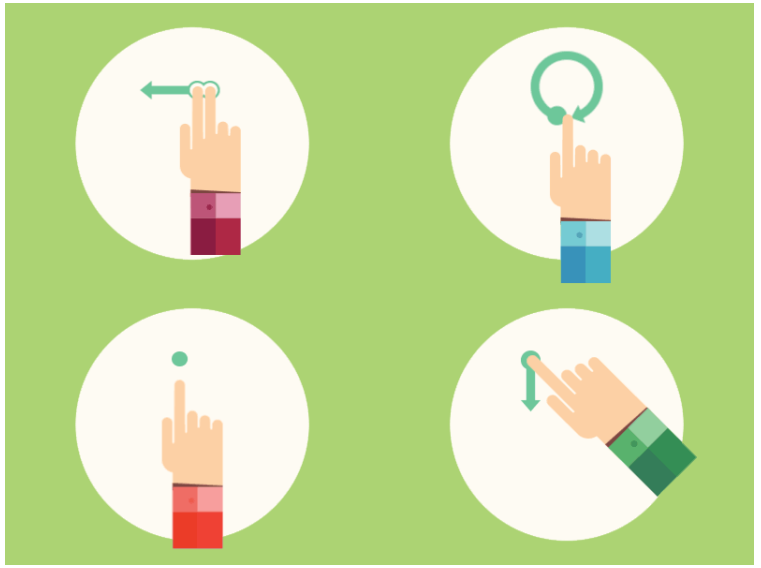
- Help visitors with suggested terms that your site uses.

*Provide **autocomplete** and **autosuggest** to provide options for users*



Procedural Memory

- **Implicit memory** = memory without conscious awareness
- One form is **procedural memory** = memory for the ability to **do** something without thinking
- Examples: Riding bike, driving, typing, brushing teeth, almost any activity that has been so practiced as to become an **Automatic Process**
- Very key example is *mobile gestures*

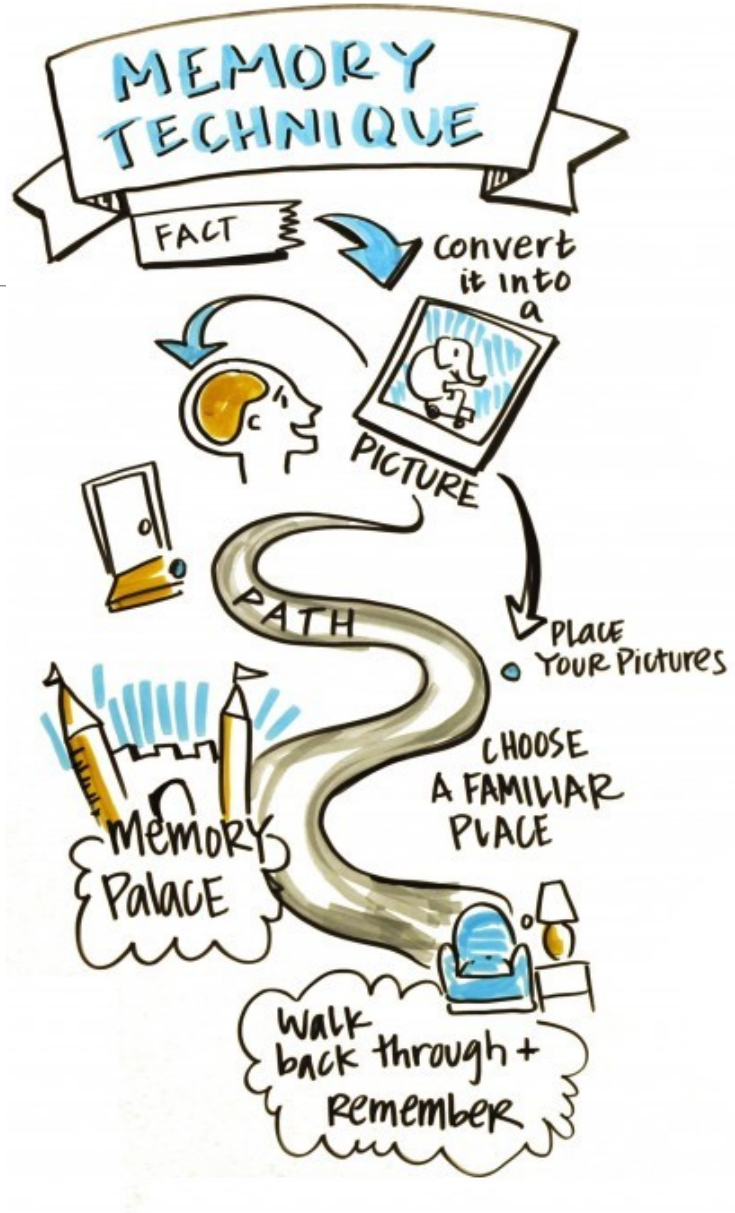


https://dribbble.com/shots/1231231-Mobile-Gestures-vector-free-gif

Not an HCI concept

Method of Loci

- Useful technique for recalling an ordered sequence of item
- Mentally created locations "contain" items
- To recall, "walk through" the space
- Why it works:
  - Imposes organization on unorganized list
  - Creating associations between locations and items is ***elaborative (deep) processing***



Remembering Everything Would Be Bad

- Weinschenk chapter, "It's a Good Thing That People Forget"
- *Forgetting isn't a bug, it's a feature*
- *We would not be able to function if every memory were accessible*
- *So we live with it … and design for it*

http://www.scientificamerican.com/article/trying-to-forget/

Summary

- Time and interference are determiners of memory decay (forgetting)
- Recognition is easier and faster than recall
- Memories for doing actions—procedural memory—are stored in LTM
- UIs can do much to accommodate human memory limits