Week 8 - Day 2 (Chapter 8 part 1 - Memory)

Wednesday, March 2, 2016

8:35 AM

Memory locations quizlet: <https://quizlet.com/_22kws4>

Vocab quizlet: <https://quizlet.com/_22kxnu>

Audio recording started: 12:02 PM Wednesday, March 2, 2016

Announcements

* Exam on Monday, March 7th (don’t forget homeworks!)
* Catch-up / review on Friday
* If you want to start studying…
  + Chapter 8 sections:
    - Manufacture of memory
    - Measuring memory
    - Models of memory
    - **The three-box model of memory**
    - Good to know:
      * How we remember (not covered in lecture)
        + Mnemonics
        + Maintenance rehearsal
        + Elaborative rehearsal
        + Deep processing
      * Why we forget
      * Eyewitness testimony in adults

What is memory?

* Identity is made up of memories, including recollections and knowledge of skills
* Memories are often incomplete, biased, and distorted
* Can you think of an instance where you and a friend or relative have had different memories of the same event?
* We have multiple memory systems, and each memory system has its own “rules”

How do we measure memory?

* Explicit memory
  + Conscious, intentional recollection of an event or of an item of information
  + Two methods
    - Recall (e.g., essay questions)
    - Recognition (e.g., multiple choice)

* Implicit memory
  + Bookmark added at 05:24 in Audio 1
  + Unconscious retention in memory
    - Things that we pick up and we're not aware of how we learned it
  + Evidenced by the effect of a previous experience or previously encountered information on current thoughts or actions
    - Something we've encountered before, even if we don't explicitly remember it, affects our thoughts now
  + Examples?
    - Priming, relearning method, “false fame”
      * Priming
        + Subliminal advertisements

Researchers have flashed emotional faces while they are in the middle of a task

A sad face tends to make people sad even though they don't even know they've seen one

* + - * Relearning method
        + Learn how to do something

Later on you haven't done it in a while, but you're able to relearn it faster than you originally learned it

* + - * False fame
        + Researchers showed participants two lists of names

One was clearly famous people

The other was random, official sounding name

Identify which ones are famous

The next day they brought them back and had them do it on another set of lists

What they found was that people were still naming the actually famous people and the new non-famous people, but the previously-viewed non-famous names now seemed famous because they weren't aware that they learned these names in the previous study

Bookmark added at 10:49 in Audio 1

Information-processing models

* Compare the working of memory to the actions of a computer
* Memory operates over time in three phases:
  + **Encoding**: the processing of information so that it can be stored
    - Then it's taken for storage
  + **Storage**: the retention of encoded representations over time
    - Put the information into memory
  + **Retrieval**: the act of recalling or remembering stored information when it is needed
    - What's the point of storing if you aren't going to use it again?
* Bookmark added at 12:20 in Audio 1

achine generated alternative text:
Information-processing models 
Sensory 
in

* Keyboard = encoding
* Hard drive = storage
* Folder mechanisms = retrieval
* **Three-boxes of information processing**

* Storage of memories takes place in three interacting memory systems

* The three systems include:

* **Sensory register**

* **Short-term memory (STM)**

* **Long-term memory (LTM)**

achine generated alternative text:
Sensory reg ister 
I _ Large capacity 
2_ 

Sensory memory is brief

* **Sensory memory:** a memory system that very briefly stores sensory information in close to its original sensory form
  + Researchers have concluded that sensory memory persists for about 1/3 of a second and then progressively fades

* Sensory memories enable us to experience the world as a continuous stream rather than in discrete sensations (e.g., the way a movie projector plays a series of still pictures)

STM is active

* Material is passed from sensory memory to short-term memory

* It is either passed to LTM or decays

* More recently, psychologists have come to think of short-term memory as working memory

* **Short-term memory**: a memory storage system that briefly holds a limited amount of information in awareness

Bookmark added at 19:56 in Audio 1

* **Working memory**: an active processing system that keeps different types of information available for current use (e.g. sounds, images, ideas)

* Information remains in working memory for about 20-30 seconds unless you actively prevent it from disappearing by thinking about or rehearsing the information
  + Ex is you want to make coffee and someone starts talking to you. You won't forget that task, but you kind of have to actively remember it.
* **Memory span**
  + George Miller: 7 +/– 2 items
  + Varies among individuals and increases as children develop
  + Evidence to suggest can increase the capacity of memory span

* **Chunking**: Organizing information into meaningful units to make it easier to remember
  + UTPHDNYUMAUCLABAMIT
  + UT PHD NYU MA UCLA BA MIT
  + You group your social into 123 - 45 - 6789

LTM is relatively permanent

* Bookmark added at 25:50 in Audio 1
* **Long-term memory** is a relatively permanent, virtually limitless store
  + Works better if you use memory techniques
* Long-term memory enables you to remember nursery rhymes from childhood, the meanings and spellings of words you rarely use, what you had for lunch yesterday, etc.

* What gets into long-term memory?
  + Bookmark added at 27:13 in Audio 1
  + Information is most likely to be transferred from working memory (STM) to long-term memory if it is repeatedly retrieved, deeply processed, or helps us adapt to an environment
    - Ex: tying your shoes
  + Evolutionary theory helps explain how we decide in advance what information will be useful
    - Animals that can use past experiences to increase their chances of survival have a selective advantage over animals that fail to learn from past experiences

achine generated alternative text:
son 
Oxygen 
Cow 
Milk 
Grass 
Udder 
Wing

* LTM is conceptualized as a graph (network)
  + Animal
    - Breathes
      * Oxygen
    - Eats
      * Food
    - Has
      * Skin
    - Can
      * Move
  + We form networks in this way which perpetuates LTM

Contents of LTM

* Bookmark added at 30:10 in Audio 1
* Two systems, working independently of one another:
  + **Procedural memories**
    - Memories for the performance of certain actions or skills
    - “Knowing how”
    - Motor skills, habits, behaviors employed to achieve a goal
      * Coordinate muscle movement to ride bike
      * Following rules: stop at red light
    - Consciously thinking about these tasks makes them harder
      * “Choking”
        + Like a professional athlete screwing up because they overthought what was being performed
    - Are likely implicit memories
      * Once they are learned, they require very minimal conscious processing
        + Ex: stopping at a red light

You don't have to remember to stop at a red light

* **Declarative memories**
  + Memories of facts, rules, concepts, and events
  + “Knowing that”
  + Knowledge we can declare and consciously bring to mind
  + Types of declarative memory:
    - **Episodic memory**: person’s past experiences, including time & place
    - **Semantic memory**: knowledge of facts independent of personal experience
  + Tends to be more explicit
  + Bookmark added at 37:03 in Audio 1

Memory in action

**Serial position effect**: The ability to recall items from a list depends on order of presentation, with items presented early or late in the list remembered better than those in the middle

**Primacy effect**: better memory for items at the beginning of the list (reflects long-term memory)

**Recency effect**: better memory for the items at the end of a list (reflects working memory or STM)

Memory is the result of brain activity

* Memory researchers have made tremendous progress over the past two decades in understanding what happens in the brain when we acquire, store, and retrieve memories
* What role does biology play in the processing of information?

H.M.

* Man suffering from daily grand seizures
* At 27 doctors took a radical surgical approach to quiet the seizures
  + Removed medial temporal lobes and hippocampus
* Surgery caused H.M. to lose the ability to remember things over long periods of time
  + The original “10 Second Tom”
  + Bookmark added at 45:09 in Audio 1
* Participated in countless experiments and became one of the most famous people in memory research
  + Learned new many new things, although he didn’t remember it

Memory's physical locations

achine generated alternative text:
Prefrontal cortex 
working memory 
Tempora

Consolidation of Memories

* **Consolidation**: a process by which immediate memories become lasting (or long-term) memories

* The medial (middle) temporal lobes may be responsible for coordinating and strengthening the connections among neurons when something is learned and play an important role in the formation of new memories

* Actual storage occurs in the particular brain regions engaged during the perception, processing, and analysis of the material being learned (e.g. sound is stored in the areas involved in auditory perception)

* Remembering something seen or heard involves reactivating the cortical circuits involved in the initial seeing or hearing

* Once the connections are strengthened sufficiently, the medial temporal lobes become less important for memory

Vocab:

|  |  |
| --- | --- |
| Three-box model of memory | Models the way memories are stored via three different interactive systems |
| Explicit memory | Conscious, intentional recollection of an event or of an item of information |
| Implicit memory | Unconscious retention in memory (not sure how you got the memory) |
| Encoding | The processing of information so that it can be stored |
| Storage | The retention of encoded representations over time |
| Retrieval | The act of recalling or remembering stored information when it is needed |
| Sensory register | Memory system which contains sensory information (large capacity) |
| Short-term memory (STM) | a memory storage system that briefly holds a limited amount of information in awareness |
| Long-term memory (LTM) | relatively permanent, virtually limitless memory storage system |
| Sensory memory | A memory system that very briefly stores sensory information in close to its original sensory form |
| Working memory | An active processing system that keeps different types of information available for current use (e.g. sounds, images, ideas) |
| Memory span | The limit to what we can keep in mind at once (Estimated to be 7 +/- 2 items) |
| Chunking | Organizing information into meaningful units to make it easier to remember |
| What goes into long term memory | Information that is repeatedly retrieved, deeply processed, or helps adapt to environment |
| Procedural memory | Subset of LTM which specifies how to do something (Ex: coordinate muscle movements to ride a bike) |
| Declarative memory | Subset of LTM which requires understanding or processing of the concept memorized (Knowing something. Something you can talk about) |
| Episodic memory | Subset of declarative memory which describes a person's past experiences |
| Semantic memory | Subset of declarative memory which describes knowledge of facts independent of personal experience (Ex: You don't have to have been to Japan to know the capital is Tokyo) |
| Serial position effect | The ability to recall items from a list depends on order of presentation, with items presented early or late in the list remembered better than those in the middle |
| Consolidation | Process by which immediate memories become lasting memories (or long-term) |