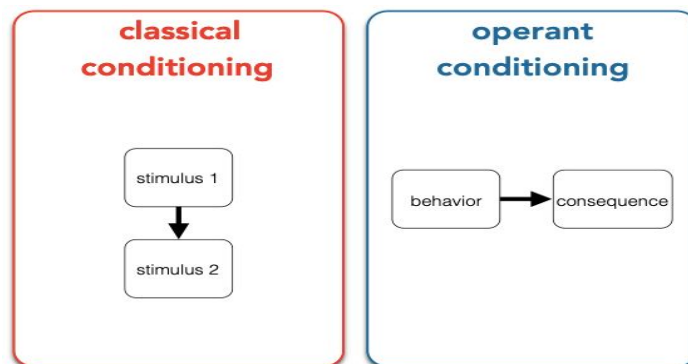


Lecture 1: Learning

- John B. Watson - The approach that psychology use **objective science** to predicting & controlling **behavior**.
 - Argued that behaviourism was important, mental events were shamed
- **Learning** is an adaptive process in which the tendency to perform a particular **behavior** is **changed by experience**.
 - 2 main criteria:
 - ❖ Change in behaviour that is based on experience
 - Through **cognitive learning** we acquire mental information that guides our **behavior**
 - **Associative learning** involves learning that certain events occur together.
 - ❖ We learn through associations
 - ❖ Heard this through Aristotle, John Locke, and William James
 - ❖ **Classical Conditioning** is the process of learning associations, associating two stimuli together
 - ❖ **Operant Conditioning** is operating on the environment

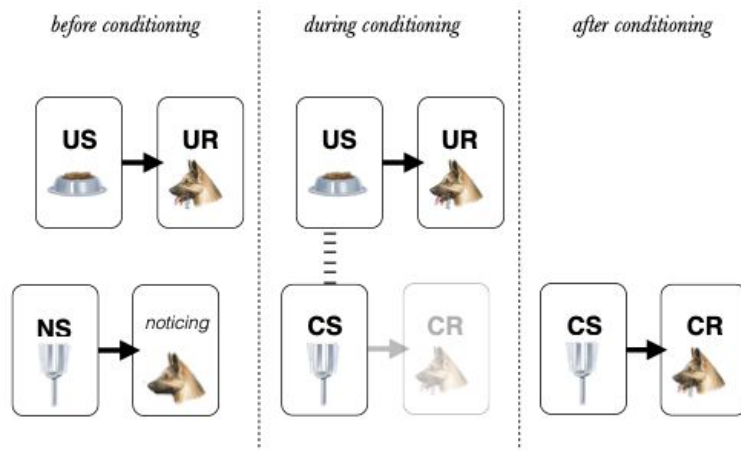


- More on... **Classical Conditioning**
 - After a simple observation, **Pavlov** abandon his Nobel Prize-winning work to describe the fundamentals of classical conditioning.

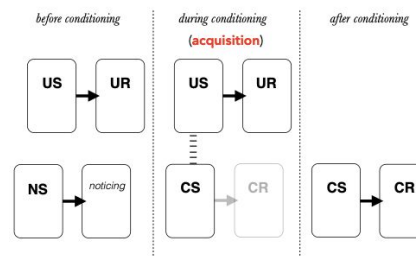


- The **unconditioned stimulus (US)** naturally & automatically elicits the **unconditioned response (UR)**.

*Know the difference between US and UR

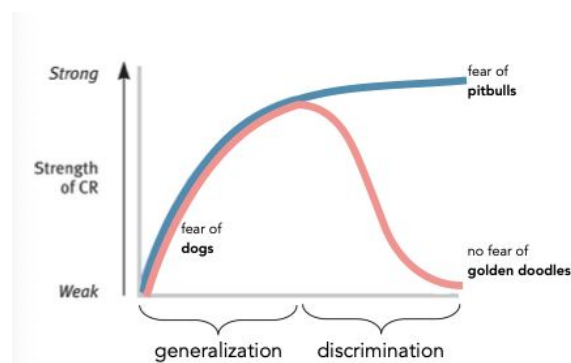
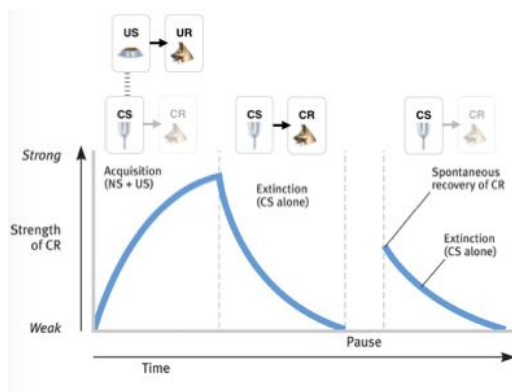


The dog is originally salivating to the unconditioned stimulus (US), but not the fork. During conditioning it relates the fork (conditioned stimulus) to the bowl of food resulting to the dog salivating to the fork.



*Make sure to know how to fill out this chart!

- 5 processes:

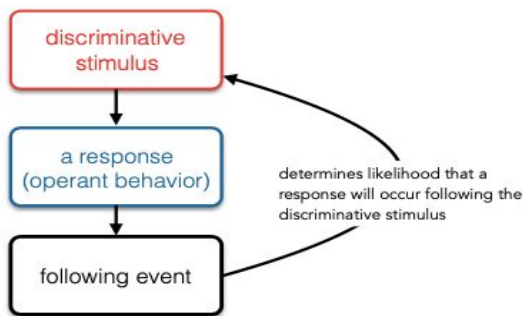


1. **Acquisition:** learning association
2. **Extinction:** eliminating association (CS alone)
3. **Spontaneous Recovery:** CS alone, elicits CR after pause
4. **Generalization:** the tendency to respond to stimuli, similar to CS
5. **Discrimination:** learn to distinguish real CS from similar stimulus

- More on... **Operant Conditioning**
→ **Thorndike's Law of Effect:**

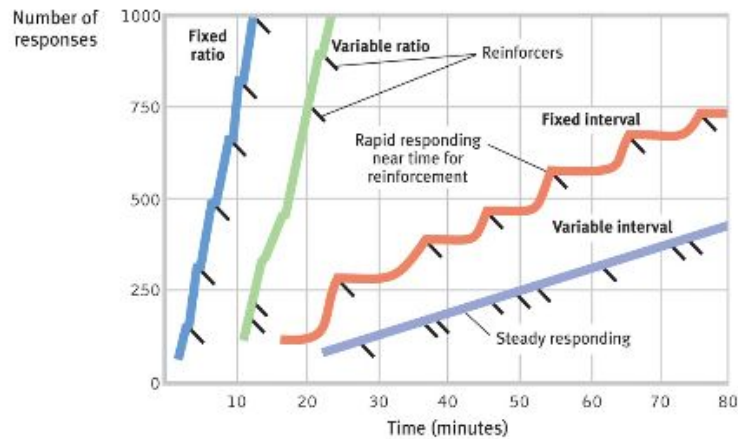
"The consequence of behaviour determines whether it will be repeated."

- **F Skinner** elaborated Thorndike's law of effect through his study of **operant conditioning**.
- Behavior is strengthened if followed by a **reinforcer** OR it is weakened if it is followed by a **punisher**
 - ❖ Discriminative stimulus sets the occasion for the behavior
 - ❖ Ex. eats favourite food before chemo, now the individual associates favourite food w/ chemo, leading to them not liking it



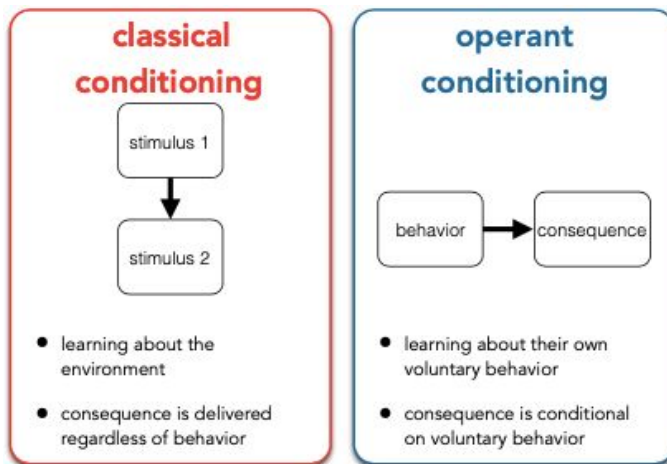
- **Add on other notes!**
- **Reinforcement** is any event that **strengthens** a preceding response.
 - Ex. Encouragement, Prizes, Promotion, Recognition, Food, Money
 - Can be **positive** or **negative**, depends on the person
 - ❖ Ex. Studying: increase grades (receive), reduce anxiety (subtract)
 - **Secondary reinforcers** have been associated with a primary reinforcer.
 - ❖ Ex. grades
 - **Primary reinforcers** are innately reinforcing because they satisfy a **biological need**.
 - ❖ Food, Shelter
 - **Continuous reinforcement** produces rapid learning, but also rapid extinction
 - **Schedules of Reinforcement**
 - ❖ **Ratio** : number of responses
 - ❖ **Internal** : times that has elapsed
 - ❖ **Fixed**: predictable
 - ❖ **Variable**: unpredictable

	Ratio	Interval
Fixed		
Variable		



- A **punisher** is any consequence that **decreases** the frequency of the preceding behavior.
 - **Positive:** administer an aversive stimulus
 - **Negative:** Withdrawing a rewarding stimulus
 - Negative Side Effects:
 - ❖ Can teach fear
 - ❖ Teaches discrimination between situation
 - ❖ May increase aggression as a way to cope with problems
 - ❖ May cause injury
 - Punishment tells you what not to do, while **reinforcement** tells you what to do.

Contrasting Conditioning



* **Test Wiseness:** ability to take a test

Observational Learning

- Classically conditioned and operantly conditioned behaviors can be **acquired through observation**
 - We may experience vicarious reinforcement or vicarious punishment by watching a model
- Does viewing media violence trigger violent behavior?
 - There is a correlation between the two

Lecture 2: Memory

- Clive Wearing
 - Remembers: Writing, Motor Skills, and things/people (Information)
 - Can't Remember: Experiences. Thoughts/Dreams (Consciousness)
 - **Episodic**: Experiences
 - **Semantic**: Information
- What are some **concepts** associated with **memory**?
 - Storage (What kind of storage?)
 - Specific Information
 - Recall
 - Remembering
 - Thinking
 - Recognition
 - Ideas
 - Process

Memory Structures & Processes

- Information Processing, Model of Memory
- **Memory Structures**:

→ **Sensory Memory**, briefest memory system, based on **direct sensory stimulation**.

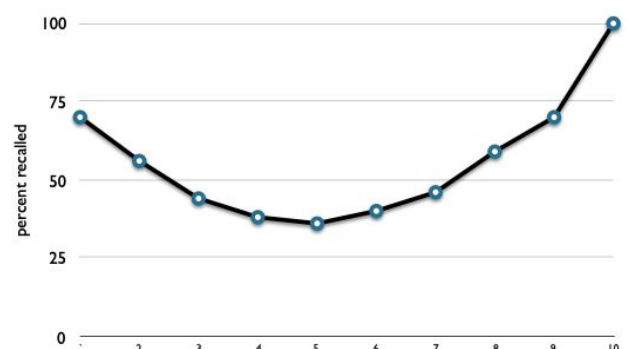
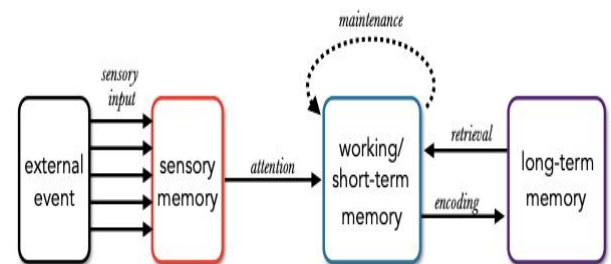
- ◆ Questions: How much memory can be stored?
- ◆ How long can it be stored for?

→ **Iconic Memory**, mental representation outlasts the physical stimulation

- ◆ Originally started testing this w/ the use of dots, realized that people manipulated the system by guessing, moved on to using arrays of letters
- ◆ Iconic memory proves that people remember about 33% of information
- ◆ **George Sperling** wondered if **more** information is represented in iconic memory than we can report.

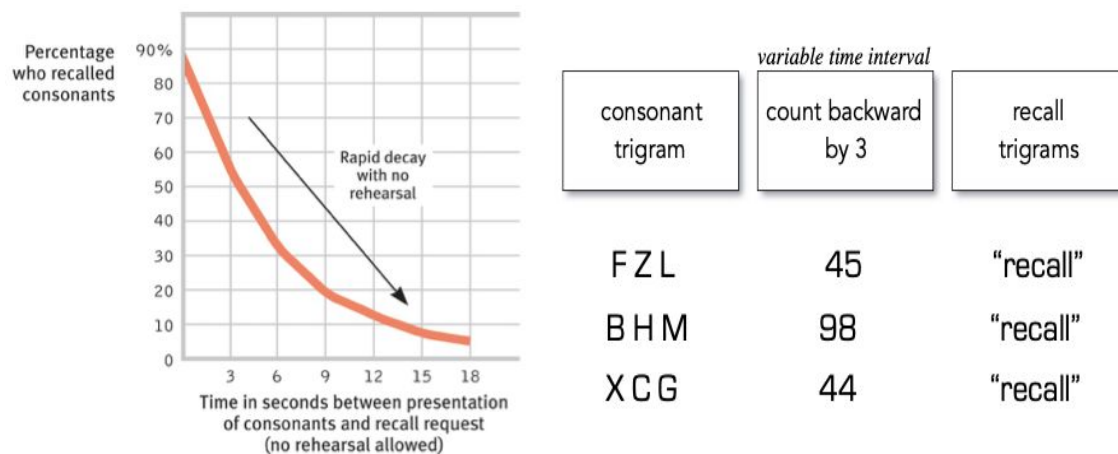
→ **Short Term Memory (STM)/Working Memory**, part of memory that is being processed right now, consciously.

- ◆ Anything that was up to 30 seconds ago
- ◆ Also called working memory
- ◆ **Serial Position Curve**, plots the likelihood of recall as a function of its position on the list



- **Primary Effect** (0-3): superior recall for items at the beginning, part of long term memory
- **Recency Effect** (10): superior recall for items at the end of the list, recalled first

- ◆ **Brown - Peterson Paradigm**, gave a consonant trigram and told the people to count backwards by 3, then recall the trigram, were attempting to prevent rehearsal of the letters
- ◆ Preventing rehearsal of the letters made the info available to them for about 18-20 seconds



➔ Long-term Memory (Encoding & Automatic Processing)

➔ 2 types:

1. **Automatic/Implicit**: information you can have no conscious awareness of encountering or accessing
 - a. Automatic, w/o effort
 - b. Includes space, time and frequency
2. **Effortful/Explicit**: information you are consciously aware of retaining or accessing
 - a. Effortful
 - b. **Explicit memory** for facts and experiences is most effectively encoded through **effortful processing**.
 - c. **Von Restorff Effect**: items that are distinctive are recalled better.
 - d. **The spacing effect**: the more a person is exposed to info, the more likely it will be remembered
 - i. Make a concept list
 - ii. Make a mind map to figure out how the ideas are related
 - iii. Try to recall everything from the mind map

iv. Go back to notes and figure out missed concepts

- **Memory Processes**

- Attention (Selection)

- Maintenance

- 1. **Repetition, mind maps**

- 2. **Making Connections**

- 3. **Mnemonic**

- a. **Mental or physical devices** used to aid memory.

- 4. **Imagery**

- 5. **Practice recall**

- Encoding

- ◆ **Hierarchies & Organization:** Trees that were **organized** categorically elicited an average recall of 73 items, while trees that were **randomly** arranged elicited an average recall of only 21 items

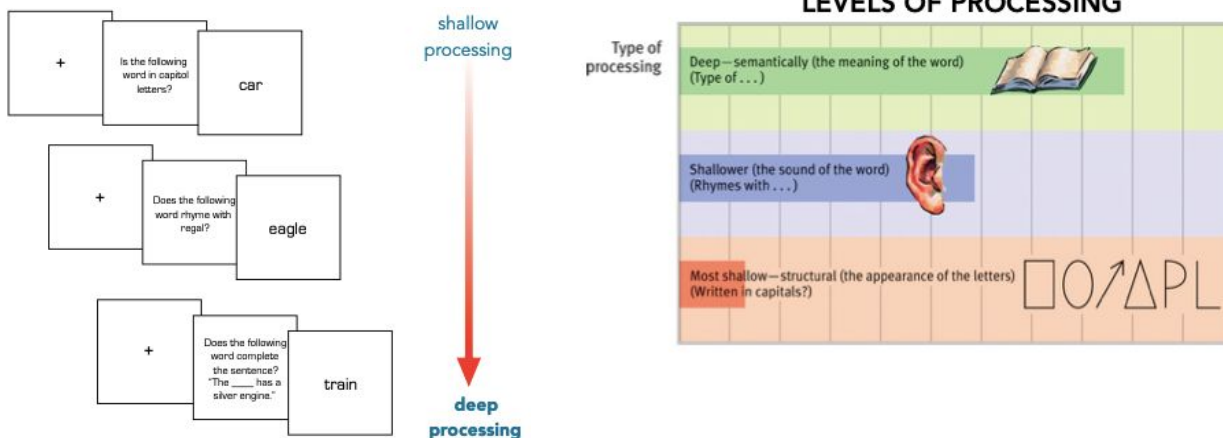
- ◆ Correlation between note taking and overall course performance, positive experience

- Taking notes serves two functions: **external storage & encoding**.

- ◆ **Deep** processing involves encoding information at a **semantic level**.

- **leads to better recall** during a subsequent memory test.

- ◆ **Shallow** processing involves encoding information at a **perceptual level**.



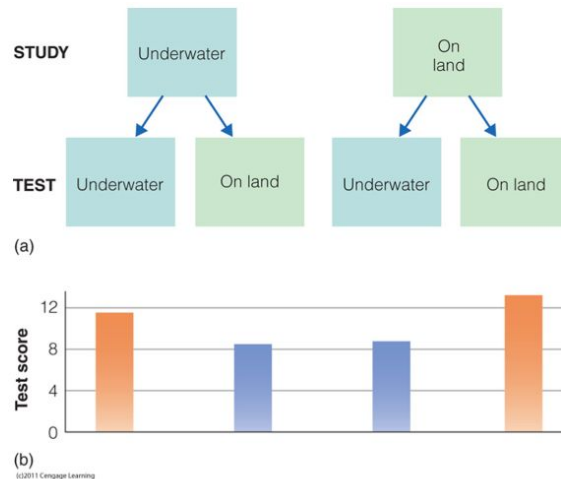
- ◆ **Self-referential** effect means that people recall information **better** when it is related back to the self during **encoding**.

- Retrieval

- ◆ **Context-Dependent Memory:** information is encoded along w/ contextual details

- ◆ External Details get swept up

- ◆ Consequence: Reinstating context can serve as retrieval cue



◆ Encoding = Retrieval

➤ Retrieval is:

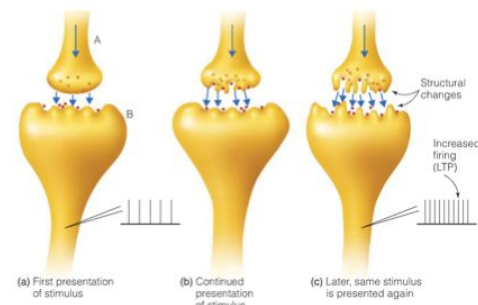
1. context dependent (physical contact)
2. State/Mood Dependent (Internal contact)

Neuroscience of Memory

- **Consolidation** is the process by which information in STM is transferred into LTM.
 - ➔ STM is the activation of a circuit of neurons
 - ➔ LTM is when there are structural changes that solidify connections between neurons
- **Long-Term Potentiation (LTP)**: enhanced firing of neurons after **repeated** stimulation, leads to a longer memory of it

“Neurons that fire together wire together”

- **Hippocampus**: a structured embedded in the temporal lobe, is critical for **consolidation**.
 - ➔ Subcortical
 - ➔ Acts as an index for elements of a remembered episode



- Henry Molaison, known as HM
 - ➔ Got into a bicycle accident and started getting seizures everyday

- Neuroscientist said he would remove his whole temporal lobe, which improved his seizures, HOWEVER he ended up losing the ability to make new long-term memories, while retaining the function of his short-term memories
- Led to **anterograde amnesia**: an inability to form **new** explicit memories.
- Another type of amnesia is **Retrograde Amnesia**: the loss of ability to access memories that were **previously** available.

Failures of Memory

- **Interference**: different memory traces compete with each other for retrieval, making it difficult to access the desired information
 - Competition for retrieval
 - 2 forms of interference:
 1. **Proactive Interference**: pro is the “new” information, interferes w/ new info
 2. **Retroactive Interference**: retro is the “old” information, interferes w/ old info
- **Source Amnesia**: when you forget the source of the information
 - Ex. **Cryptomnesia**: erroneously think they’re having an original idea