

## Day 1 (12/3)

### Thinking

- **Forming concepts**—mental groupings of similar objects, events, ideas, and people.
  - We often form our concepts by developing **prototypes**—a mental image or best example of a category

## Day 2 (12/7)

### Problem Solving

- Sometimes solve problems through trial and error
  - **Algorithms**, step-by-step procedures that guarantee a solution
  - **Insight**—an abrupt, true-seeming, and often satisfying solution (burst of activity in the right temporal lobe)
- **Confirmation bias**: more eagerly seek out and favor evidence verifying our ideas than evidence refuting them
  - A prime example of fixation is **mental set**, our tendency to approach a problem with the mind-set of what has worked for us previously
- **Intuition**: our fast, automatic, unreasoned feelings and thoughts
- When we need to act quickly, the mental shortcuts we call **heuristics** enable snap judgments.
  - The **availability heuristic** operates when we estimate the likelihood of events based on how mentally available they are.
- Other types of heuristics
  - **Forming Subgoals**: By breaking a problem down into smaller steps, we can approach larger more complex problems
  - **Working backward**: starting with a final solution and working back one step at a time to the beginning; this only works when possible final solutions are known
  - **Searching for Analogies**: observing the similarities between a new problem to be solved and one you've successfully solved in the past
  - **Changing the representation of the problem**: When our problem-solving efforts fail, sometimes it is useful to look at the problem in a different way
- **Overconfidence**: the tendency to be more confident than correct—to overestimate the accuracy of our beliefs and judgments
  - **Belief perseverance**: the tendency to be more confident than correct—to overestimate the accuracy of our beliefs and judgments

- Once beliefs form and get justified, it takes more compelling evidence to change them than it did to create them.
- **Framing**, the way we present an issue, sways our decisions and judgments
- **Problem-solving** is a more complex process, involving a lot of decisions or judgements along the way to finding a solution.
  - **Decision-making** involves evaluating and choosing between different courses of action or options available to us
  - So decision-making is part of problem-solving

### Decision-Making Techniques

- **Additive Strategies:** All possible options or variables are weighed or given a score (good or bad) and then compared to each other in order to make a decision
  - Purely additive - the option with the highest positive score wins
  - Weighted additive - attributes are weighted differently, depending on their importance
- **Elimination by Aspects:** Evaluating each individual item based on a set of criteria you have established and eliminating an item if it doesn't fulfill these criteria
  - Your list of alternatives slowly becomes shorter and shorter until you arrive at only one option
- **Expected Utility:** Used for analyzing situations where we must make a decision with an unknown outcome (uncertainty)
  - We choose the options which will result in the highest probability of a positive outcome for us
- **Subjective Utility:** The attractiveness of an option is based on the individual perceptions of the decision-maker
  - In other words, people place a different value on the outcomes

### Hurdles to Problem-Solving

- **Mental set** (rigidity): The tendency to fall into established thought patterns
  - Some sets may work well in solving one problem, but be totally useless in another situation
- **Functional fixedness:** The ability to see a new use for an object
- **Confirmation Bias:** We look for evidence to confirm our beliefs and ignore evidence that contradicts them
  - In an experimental setting, you're more likely to arrive at a result if you expect to arrive at that result
- **Framing:** The way a problem is presented can drastically affect the way we view it.
- **Creativity:** Little correlation between creativity and intelligence
- **Convergent thinking** vs. **Divergent thinking**
  - Convergent: Solving problems with a single correct answer

- Divergent: Solving problems with many possible solutions

## Day 3 (12/9)

All languages contain...

- **Phonemes:** The smallest units of sound in a language
  - English has about 44 phonemes
- **Morphemes:** The smallest unit of meaningful sound
  - Can be words like *a* or *but*
  - Can also be parts of words like prefixes or suffixes... “ed” at the end of a word means past tense
- Languages different in the number of phonemes and morphemes
- Grammar: The rules of a language
  - Syntax: The order of words in language
  - Semantics: How we get meaning from morphemes, words, and sentences
  - Must have syntax before semantics!

## Day 4 (12/13)

Language Acquisition

- Children learn very early to understand what is said to and about them
  - This is followed by productive language skills
- Stages that we learn to use language
  - **Babbling language**
  - **Holophrastic State (one word stage)**
  - **Telegraphic Speech Stage (two word stage)**
    - After the telegraphic stage we get **overgeneralization**, aka overregularization
- **Social Learning Theory**
  - B.F. Skinner from the Behaviorist School
  - Baby may imitate a parent
  - If they are reinforced, they keep saying the word.
  - If they are punished, they stop saying the word
- **Chomsky’s Theory (nativist theory)**
  - We learn language too quickly for it to be through reinforcement and punishment
  - We must have an inborn universal language acquisition device
- **Fast Mapping Theory**
  - A child forms an idea of a new word’s meaning after hearing it only once or twice

- May help to explain the incredible rate at which children acquire new vocab
- Linked to improved articulation skills, improved understand of syntax, underlying cognitive development
- **Whorf's Linguistic Determinism and Linguistic Relativity**
  - **Linguistic Determinism:** The idea that language determines the way we think
  - The Hopi tribe has no past tense in their language, so Whorf says they rarely think of the past
  - **Linguistic relativity:** Our view of the world is relative to the language we speak. People with different language view the world differently
- **Evolutionary Advantages:** Human language may be a result of evolutionary processes because language allows humans to acquire information about the world secondhand
- **Interactionist/Emergentist Perspective**
  - Tries to unite behaviorist and nativist theories
  - Says that neural circuits supporting language emerge in the brain as a result of language learning experiences
  - In other words, social interaction with our environments leads to the emergence of language-based neural pathways