Unit 1: Categorization

* Our everyday decisions rely on quick categorization abilities
  + i.e. While riding the transit bus, you notice a man with a cane get on at the next stop. Should you offer your seat or avoid eye contact?
  + i.e. You check your schedule and realize you can an upcoming project. Is it an immediate priority or one for the back burner?
  + i.e. You walk across a store and recognize an odd yet familiar odour. Is it pleasing or foul?
* Our interaction with the world is filled with colours, shapes, textures, smells, tastes, and sounds, yet we can still make sense of it all
  + Attention: Helps you focus finite mental resources on key parts of the active scene
  + Memory: Helps you recall specific thoughts and behaviours which are appropriate to your current needs
* Your cognitive ability to put people, objects, and ideas into categories and concepts helps you to efficiently process through incoming data stream and make appropriate responses
  + Without the ability to categorize, every decision becomes overwhelming
    - Making the simple decision of whether you should give up your seat to the man becomes very challenging
      * i.e. Is he an old man or a young man?
      * i.e. Why does he have a long stick?
  + Without the cognitive ability to categorize, every sensory experience would be completely unique
    - You would be unable to make connections from the past and unable to make simple, routinely decisions
      * i.e. Determine that Aspiring is best for hangovers

Unit 2: Functions of Categorization

* 1. Classification
  + Allows you to treat objects that appear differently into the same category
    - i.e. Green, red, and yellow apples
    - i.e. Laptops and computers
* 2. Understanding
  + i.e. Two people in a heated argument do not need your opinion(s)
* 3. Predicting
  + By categorizing your current experience and comparing it to similar experiences in memory, you can make predictions about your current situation
    - i.e. If you know that an animal is a dog, you can predict that it likes getting its belly rubbed
* 4. Communication
  + Many of the words in language refer to some category or concept
    - i.e. Furniture, cat, sport, and classroom
      * Using the category “name” allows for efficient communication
        + i.e. Imagine how hard it would be to communicate if you had to describe every word you said
* The illusion of the expert
  + The feeling that a task must be simple for everyone because it is simple for oneself
    - We are all experts at something
      * i.e. Tying your shoes may be easy for you, but not to a child
      * i.e. String theory is basic for a physicist but difficult for you

Unit 3: Rules

* Categorization is just more than simple rules
  + i.e. All four-legged, fluffy, cute, and living animals are NOT dogs. They can also be cats
    - i.e. When trying to categorize furniture, does your criteria include rugs, chairs, and desks, but not table saw
* Humans have an internal representation of categories that is independent of the rules we’ve use to try to define them
  + i.e. A bachelor is an unmarried male, but we automatically know to disavow the pope and toddlers

Unit 4: Prototype Theory

* We categorize objects by comparing them to an internal “best” representation of a given category
  + Thought to be the average or “best” member of a category
    - The first thing that comes to mind when given a category
      * i.e. Fruit 🡪 Apple
* Formed through experience and can be very personal
  + All the objects you’ve previously encountered are averaged together
    - i.e. The prototype for bird can be a robin for some people, parrot for others, and penguin for people who live in igloos
* We categorize new objects by comparing them to prototypes
  + i.e. You are walking through a forest and come across a weird looking plant. You are having trouble classifying it as a tree or a bush
* Responding quickly to familiar members is evidence for prototype theory
  + i.e. People are quicker to respond to the statement: “A robin is a bird”, than the statement: “A penguin is a bird”
    - This suggests that typical category members that are closer to the prototype, are categorized more quickly and easily than atypical category members
* Prototype theory cannot explain why internal representations change over time
  + i.e. You may give different answers for an example of a category, when asked at different intervals and times
    - i.e. Week 1: Apple, week 2: orange, week 3: banana, etc.

Unit 5: Exemplar Theory

* We categorize objects by comparing them to every previously stored experience (exemplar) in a given category
  + i.e. You remember every type of dog you met, when trying to categorize a newly encountered dog
* When faced with something new, you quickly search through your library to find something that resembles the object
  + i.e. When you meet a new four-legged creature, you can classify it as a dog because it resembles one of your previous encounters
* Exemplar theory can equally explain why we respond quicker to more familiar birds
  + We are quicker to respond to the statement: “A robin is a bird”, because we have had more encounters with it (more examples in our memory)
    - i.e. 5 encounters with robins Vs. 1 encounter with a penguin
* Skin diagnoses by dermatologists are influenced by more recent experiences
  + Dermatologists are more affected by a single recent example as opposed to the entirety of their experience
* Prototype theory can explain simple categorization better than exemplar theory
* Exemplar theory is a game of numbers; it is NOT temporal

Unit 6: The Development Of Categorization

* How and when do we develop the ability to categorize?
  + Evidence suggests that children as young as 3 are able to understand general categories, and newly learned information
    - * i.e. Know that all dogs like doggy treats
* Children know that you can change the nature of a machine, but not the nature of an animal
  + i.e. You can theoretically turn a toaster into a teapot, if you cover all the holes, and make it waterproof
  + i.e. You cannot turn a raccoon into a skunk, even if you paint it all black, add white stripes, and give it a pungent odor

Unit 7: Animal Categorization

* Baboons can be taught to classify objects with high accuracy
  + Using instrumental conditioning, scientists taught baboons to classify things as food and non-food
    - The baboons were able to make this distinction with 90% accuracy
* Baboons can also be taught to classify using more abstract rules
  + Reached a 90% accuracy to classify same objects Vs. different objects
* Animal categorization may not necessarily demonstrate language ability
  + Basic categorization systems are present in non-human animals

Unit 8: Conclusions

* Categorization allows you to treat members of the same family, similarly, and make predictions regarding new categories members
  + This leads to stereotyping and explains how representative heuristics are related

Lecture Notes

* Allows for efficient navigation through the world
  + Captcha uses this on sites to determine whether you are a robot or human
    - Robots struggle to categorize
* 3 levels of categories
  + Superordinate level
    - Most general [higher chance for accuracy; low predictive power]
      * i.e. Furniture
  + Basic level
    - Basic
      * i.e. Chair
  + Subordinate level [lower chance for accuracy, high predictive power]
    - Most specific
      * i.e. Windsor
* Expertise determines speed of category verification
  + An expert can categorize at the basic/subordinate level quicker than the novice
  + A novice can categorize at the superordinate level quicker than the expert
* Your perception of the world is guided by prior experience, biases, and heuristics
* Categorization interacts with schema
  + Schema is a large, complex unit of knowledge that encodes properties typical of instances of general categories and omit properties which are not typical of the categories

Tutorial Notes

* Illusion of the expert
  + When people who are good at something, have a hard time figuring out someone else’s problem to understand the same concept
    - The feeling that a task must be simple for everyone because it is simple for oneself
* Exemplar theory is like a filing cabinet. You group new files with the old ones if they fall under the same sub-section
* Prototype theory = Representative heuristic
  + i.e. Racism
  + You use the average of everything to define something
* Exemplar theory = Availability heuristic
  + You use the most recent examples