

Lecture 24

- Cognition – The intellectual processes through which information is obtained, transformed, stored, retrieved, and otherwise used
 - Cognition processes information – Information is obtained, transformed, kept, and used, much information is dealt with in the form of concepts
 - Cognition is active – The information that the world gives us is actively changed, kept, and used in the process of cognition
 - Obtained through senses
 - Transformed through the process of memory
 - Used in problem solving and language
 - Cognition is useful – It serves a purpose. We think there is something we do not understand. We use language when we read and to communicate something to others. We create when we need something that does not exist. Humans use cognition to survive physically and to live in a social world
- Concepts: The basic units of thinking
 - Concepts – Categories of things, events, and qualities that are linked together by a common feature or features in spite of their differences
 - Ex: Ride a bike and know that it (a specific object) is a bicycle (a generic concept) because of characteristics and know that other things are not because they do not have the characteristics of the bike
 - Concepts are categories of more than concrete things; also encompass abstract ideas
- Simple and complex concepts
 - Simple
 - Some concepts are based on a single common feature... Being a specific color for example
 - Complex
 - Conjunctive concepts = Concepts defined by the simultaneous presence of two or more common characteristics
 - The concept *aunt* is a conjunctive concept because it has 2 simultaneous defining characteristics (female and sister of 1 of your parents)
 - Disjunctive Concepts – Concepts defined by the presence of one to two common characteristics
 - Natural concepts – Concepts that are easier for humans to learn; have 2 characteristics; basic & prototypical
 - Natural concepts have a medium degree of inclusiveness (number of items included in a concept)
 - Super ordinate concepts are very inclusive – Contain a great number of items (vehicles)
 - Natural concepts are of a medium degree (cars)

- Subordinate concepts are the least inclusive of the concepts (Sports cars)
- Natural concepts share many characteristics, subordinate share less; Screw driver (natural), tool (super ordinate)
- Natural concepts have similar shapes, often share same motor movements and are easily named
- Natural concepts are good prototypes – Original models for which we base similar items belonging to the same group
- Attention
 - Attention – Your tendency to respond to some stimuli more than others @ a given time
 - Attentive Processes – Requires searching through the items in a series
 - Pre-attentive Processes – Something that stands out immediately, you do not have to shift attention from one object to another

Lecture 25

- Thinking and problem solving; using information to reach goals
- Without concepts, sophisticated thinking would be impossible. Understanding concepts gives us insight into the content of thinking.
- Through thinking we engage in problem solving – the cognitive process through which information is used to reach a goal that is blocked by some obstacle
 - Obstacles to problem solving:
 - Mental set – Approaching a new problem in the same way that was successful in the past. A habitual way of approaching or perceiving a problem
 - Functional Fixedness – Mentally seeing an object as only being useful for the purpose in which it was intended
 - Learned Helplessness – The accepting of pain or failure in the future due to the belief a problem is out of your control
- Very often a problem has more than one solution. Our task is then to generate a list of possible solutions, evaluate each one by attempting to foresee what effects or consequences it would produce, choose the best solution, and then develop an effective way of implementing it
- The cognitive strategies used to carry out the steps in the problem solving operations can be of 3 general types (heuristic thinking)
 - Trial and Error – The random application of one possible solution after another
 - This approach can be very time consuming and does not guarantee that a solution will be discovered
 - Know the goal, but not sure how to reach it
 - Algorithms – Systematic patterns of reasoning that guarantee finding a correct solution to a problem
 - Can be time consuming, but guarantee the solution if used correctly
 - Heuristics – Shortcuts to problem solving that do not always guarantee the solution
 - More efficient than algorithms, but not 100%

- Often entail the strategy known as Representativeness Heuristic – The strategy of making judgments about the unknown on the assumption that it is similar to what we know
- Availability Heuristic – The strategy of assuming that how easily one can remember examples of some kind of item indicates how common the item is itself
- Framing and Emotional Factors in Decision Making
 - Do we always reason logically or do our emotions often influence our decision making?
 - Framing – the way in which a problem or question is presented
 - Framing questions in positive vs negative terms can have dramatic effects on the decision making of even highly intelligent people
 - Emotion and logic are intertwined, not independent
- Creative Problem Solving: Convergent and Divergent Thinking
 - Creativity – The ability to make human products and ideas that are both novel and valued by others
 - Convergent thinking – Thinking that is logical and conventional and that focuses on a problem
 - Divergent thinking – Thinking that is loosely organized, only partially directed and unconventional
 - Several possible solutions
 - Break out of mental sets more easily, less likely to suffer from functional fixedness

Lecture 26: Symbolic Communication

- Language is one of the most significant cognitive achievements of human beings. Without language, human beings and human civilization would be nearly nothing
- Language – A symbolic code used in communication
 - Without language, it would not be possible to coordinate the efforts of many people in a division of labor, to regulate their behavior for the common good through laws, or to amass the wisdom learned through experience by previous generations and pass it on through education
- Semantics: The meaning of what is said to someone. That something is the semantic content – the meaning in symbols such as language
 - Semantic Content and language codes are not the same thing. Semantic content is the meaning and language codes are the organization of language
 - Noam Chomsky – Distinguished between the semantic content and language code by using the terms
 - Surface structure – the superficial spoken or written structure of a statement
 - Deep structure – The underlying structure of a statement that holds its meaning
- Property of language: Elements and rules

- We generate language from a set of elements and a set of rules for combining them into speech. It is often said that language is Generative – the ability to create an infinite set of utterances using a finite set of elements and rules.
- The elements and rules of language:
 - Phonemes – The smallest units of sound in a language
 - 44 Phonemes in the English language
 - Include combinations like CH
 - Different languages different numbers of phonemes
 - Morphemes – The smallest units of meaning in a language
 - Closely related but not the same as words. Some morphemes stand alone as words. For example, word, stand, and fast are each single freestanding morphemes
 - Other morphemes can exist only if they are bound to other morphemes
 - Think past tense such as *pushed*, plural like *cars*, and the prefix morphemes such as *tricycle*
 - The average person knows thousands of morphemes
 - Syntax – Arrangement of words to make sentences
 - There are rules for the ways in which phonemes can be combined in morphemes and rules for how morphemes can be combined in utterances
 - In English, we learn that the suffix *ed* communicates past tense and that the suffix *s* denotes plural
 - We learn the importance of word order
 - Syntax allows us to make new sentences that will immediately be understood by all speakers who speak the same language
 - Prescriptive Rules – Non proper grammar that is still understood by speakers of a language; slang for example
- Children Develop language by
 - Crying
 - Cooing
 - Babbling (phonemes)
 - Words with Meaning (Morphemes)
 - Syntax
- Language and Thought: The Whorfian Hypothesis
 - Language and thinking are closely related phenomena. Although we often think in visual images, sounds, and images of movement, much of our thinking takes place in the form of silent conversations with ourselves
 - Benjamin Whorf (1956) – Developed the idea that the structure of a language may influence the way individuals think. Known as the Whorfian hypothesis or the Linguistic Relativity Hypothesis

- Eskimos have several words for snow and can discriminate among different kinds of snow better than lifelong residents of Florida.
 - Whorf suggested the presence of these words in the Eskimo vocabulary improved visual perception
 - Certain words or labels we use in language influence how we think about people
 - Chairman or mailman might affect the way we think about females serving such roles