

□ **Chapter 10: The Thinking Mind- Thinking, Language, and Intelligence**

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□ **What do we think about?**

□ Cognition- internal mental processes including information processing, thinking, reasoning, and problem solving

□ Study of cognition covers perception, learning, memory, thinking, language, and intelligence

□ Knowledge- the entire body of information acquired through study, investigation, observation, and experience

□ To manage this, the body uses symbols or mental representations to signify information

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□ **Thoughts as Images**

□ Mental image- a representation of any sensory experience that is stored in memory and can be retrieved for use later

□ Children use visual images in their thinking

□ It is possible that language becomes an increasingly important way to organize thinking during childhood and might actually begin to overwrite or interfere with the ability to directly access visual images.

□ Concepts- an organizing principle derived from experience

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□ **Thoughts as Concepts**

□ Humans as well as pigeons and monkeys demonstrate concept formation

□ Dog example. How do you describe a dog to someone that doesn't know that it is?

Dog is a concept that is hard to describe

□ Feature detection model- people determine the truthfulness of statements by considering overlapping features.

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□ **Prototypes and Exemplars**

- Prototype- a representation of a category formed by averaging all members of the category

- Averages do not provide much information about the range of features that can be found in a category

- Exemplar- a specific member of a category used to represent the category

- Provide a better way of thinking about the variability of a category

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- **Concepts as Theories**

- Theories- sets of facts and relationships between facts that can be used to explain and predict phenomena

- Concepts can guide our thinking and be continually tested for accuracy against new, incoming information

- Concepts do not exist in isolation

- They can be viewed as part of a vast, interconnected network of memories

- We test our theory that the new item fits the category by comparing it to the prototypes and exemplars of a concept

- **Concepts and Schemas**

- Schema- expectations, personal experience and a set of beliefs

- People who are told a new fact about a very typical instance of a category are more willing to extend the new fact to all members of a category, whereas a new fact about an atypical category member is less likely to be widely applied

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- **Concepts and the Brain**

- When asked to name animals, participants showed activation in the visual cortex

- When naming tools, activation in frontal and parietal lobes associated with movement

- Concept formation also starts with experience however, this experience interacts with existing structures in the brain that help to organize our incoming information

- If forming concepts helps us to organize appropriate response, our ancestors' ability to form types of categories very quickly might have conferred a significant survival advantage.

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□ **How do we solve problems?**

□ Primary purpose of thinking is to guide behavior

□ Problem- a situation in which a current state is separated from an ideal state by obstacles

□ Problem solving- the use of information to meet a specific goal

□ 1) Understand the problem

□ 2) Make a plan

□ 3) Carry out the plan

□ 4) Look back

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□ **Understand the Problem**

□ Represent or frame the problem in a useful way

□ The mental representation we form relate to how we see the problem

□ Big, long-term problems are easier to solve if they are broken down into components, or intermediate goals

□ The representation of a problem can be improved by recognizing any personal bias you might have toward particular solutions.

□ Your amount of self-efficacy, or belief in your abilities to succeed, might also influence the way you conceive a problem

□ Functional fixedness- a possible barrier to successful problem solving in which a concept is considered only in its most typical form

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□ **Make a Plan**

□ First generate possible solutions and then choose the best one to implement

□ **Generating Solutions**

□ Requires creativity and time