

**Thinking/Cognition** refers to all mental activity associated with processing, understanding, remembering and communicating information.

To think about many things, we group them into **concepts**: the mental grouping of similar objects, events, or people.

Concepts are formed by **definition** (a triangle is a figure with three sides) or by **prototypes** (the best example of a concept with all its features).  
 \*young children often do not discriminate well when forming concepts using prototypes

**Problem Solving**

We attempt to solve problems using a variety of strategies such as:

1. **Algorithm**: A step by step procedure that always works (ex. quadratic formula). This method can be slow but you are less likely to make mistakes. An Algorithmic approach to unscramble letters to form a word would be to try all the possible combinations of letters. HPISYSC
2. **Heuristics**: "rule-of-thumb" strategies. This method is faster but you are more likely to make mistakes.
3. **Insight**: A sudden flash of inspiration. This contrasts with strategic problem solving methods.
4. **Trial and error**: trying all possibilities. This one is time consuming.

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**Obstacles to our ability to problem solve.**

1. **Confirmation Bias**: when you tend to look for answers that confirm your own expectations. (need for double-blind testing)
2. **Fixation**: the inability to look at a problem from a different perspective.
  - a. **Mental Set**: a type of fixation in which we tend to repeat solutions that have allowed us to solve similar problems in the past.
  - b. **Functional Fixedness**: occurs when you tend to think of things in their usual functions. For instance: search for a screwdriver when a knife or nickel could work



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**Making Decisions and Forming Judgments**

*We often use intuition aided by heuristics.*

**Heuristics**, or rule-of-thumb strategies, determine our judgments and can often cause us to make poor decisions. Cognitive psychologists name the following types of heuristics as possibly leading us to the wrong conclusion.

1. **Representative Heuristics: (page 11 TG)**
  - the tendency to judge things according to how well they match a particular prototype, how well something "represents" another. For example: if you were told that a person was strong, muscular, and fast, you might think that the person was some sort of athlete because those qualities best represent an athlete. However, the person could be a very fit teacher.
2. **Availability Heuristics: (10.3)**
  - the tendency to base the likelihood of events on how vivid you remembered them or how "available" the instance is in your memory. For example: when more than one plane crashes in just a couple of months, some may feel that flying is an unsafe means of transportation
  - if an event is easily recalled, we assume it is common

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*Overconfidence* and the way in which a question is posed will also determine our response to it.

3. **Overconfidence**:
  - overestimating the accuracy of your judgments. Research shows that most of the time, we are overconfident in our opinions. (Lack of confidence can be equally problematic.)
  - the most confident are often not the most correct/accurate *but* are happier and make decisions more easily
4. **Framing: (TG p13/10-6)**
  - the way information is set up or the way in which the question is asked ("framed").
  - 90% will live vs 10% will die

**Belief Bias and Belief Perseverance**

We are all susceptible to bias in the formation of our opinions.

**Belief bias**: the tendency to perceive what is conflicting with our beliefs to be illogical. We naturally tend to agree with ideas that closely resemble our own.

**Belief Perseverance**: the tendency for your beliefs to remain or be "preserved" even when given evidence to the contrary.

**Artificial Intelligence (AI)...read...!**

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