4. PROBLEM SOLVING AND DECISION MAKING

To solve problems, we engage in a variety of mental processes which help us arrive at a solution. Some of these processes help, and some may hinder finding the solution. Some of these mental processes include functional fixedness, confirmation bias, insight and intuition phenomenology, heuristics, and algorithms.

Functional Fixedness

Functional fixedness concerns the solution of object-use problems. This occurs when we look at an object as only being able to perform only a particular, intended function, instead of realizing that it may be used for another purpose as well. The basic idea is that when the usual way of using an object is emphasized, such as sitting on a chair, it will be far more difficult for a person to use the object in a novel manner, such as using the chair as a step stool to reach a light bulb.

Confirmation Bias

Confirmation bias arises when a person makes decisions based upon what he or she already believes to be true. This occurs when objective information is available, but two different sides involved in a debate each believe the information supports their respective beliefs. The actual information is not usually taken into account to come to such a conclusion; instead, only the pieces of the information which support one's own belief are considered. This leads to errors in judgment and decision-making because people tend to reason in a subjective (emotion-based) manner rather than objectively - especially when personal interests and beliefs are involved.

Insight Phenomenology

Insight phenomenology is a sudden understanding of a problem, or a strategy that aids in solving problems. This usually involves conceptualizing the problem in a new way, which is often the result of prior thought and effort. Insight is most commonly associated with unstructured problems, rather than structured problems, and usually leads to a solution because of this new way of thinking. An example of insight problem solving is the kind of puzzle in which a group of letters must be rearranged into familiar words.

There are several views regarding insight, including the "Nothing-Special" view, the Neo-Gestaltist view, and the Three-Process view. The "Nothing-Special" view argues that insight is merely an extension of ordinary perceiving, recognizing, learning, and conceiving. Thus, insight is a product of nothing more than ordinary thinking. The Neo-Gestaltist view argues that insight problem-solvers show poor ability to predict their success, and do not feel positively better as they near the solution of an insight-problem. This would support the Gestaltist belief that there is something special about insightful problem-solving, as opposed to non-insightful and routine problem solving, where one experiences positive feelings as one nears a solution.

The Three-Process view argues that there are three different kinds of insights:

- Selective-Encoding Insights, which involve distinguishing relevant from irrelevant information;
- Selective-Comparison Insights, which involve novel perceptions of how new information relates to old information; and
- Selective-Combination Insights, which involve taking selectively encoded and compared bits of relevant information, and combining them in a novel way.

Intuition Phenomenology

Intuition phenomenology is the ability to acquire knowledge without inference and/or the use of reason. Intuition is often conceived as a kind of inner perception, sometimes regarded as understanding; it provides us with views, understandings, judgments, or beliefs that we cannot always verify or justify rationally. Intuition processes typically remain unknown to the thinker because they are not deliberately thought of as part of rational thinking.

Intuition phenomenology differs from insight phenomenology in that intuition, or the gut feeling one gets, is largely influenced by past knowledge and experience, whereas insight arises suddenly for a given context or problem which is not based on previous knowledge or experience.

Heuristics

Heuristics are simple and efficient rules, learned or hard-wired over time, that help explain how people make decisions, come to judgments, and solve problems - especially when facing complex problems or incomplete information. These "mental shortcuts," as they're called, do not always lead to the correct solution, but work well under most circumstances as an efficient and relative process. We use heuristics when we accept information or strategies as 'good enough' for our needs, even though there may be a better method. Examples of heuristics include making an "educated guess", comparing similar past experiences to a current experience to solve a problem, or using "common sense. "

Algorithms

Algorithms are mental processes which relate to how people understand, diagnose, and solve problems, mediating between a stimulus and response. They are rules that are not necessarily understood, but promise an accurate solution - unlike a heuristic. A mathematical formula is a good example of an algorithm, as it has a straightforward and step-by-step way of being solved.