

## **Lesson 06:**

### **Concepts and scientific articles**

#### **What is a scientific concept?**

A scientific concept is capable of fulfilling an operational function: discrimination function or judgment function, in the interpretation of certain observations or experiments. It is a tool for effectively understanding reality, a theoretical instrument for the interpretation of phenomena.

Scientific concepts refer to a set of interconnected ideas, theories, laws, models, and principles that explain natural phenomena, establish cause-and-effect relationships, and guide scientific research. These concepts are the building blocks of scientific knowledge and provide a framework for understanding the world around us. They are based on empirical evidence, logical reasoning and rigorous testing, and are subject to revision and refinement as new evidence emerges. For example, the concept of evolution explains how organisms change over time through the processes of natural selection, genetic drift, and mutation. It is supported by a vast body of evidence from fields such as genetics, paleontology, comparative anatomy and biogeography. Likewise, the concept of relativity describes how space, time and gravity are related and is supported by experimental tests and mathematical equations.

#### **Variables**

A variable is a value that changes depending on different factors. Some variables change easily, like stock values, while others are almost constant, like someone's name. Researchers often seek to measure variables. The variable can be a number, a name, or anything that has a potentially changeable value. An example of a variable is temperature; this changes depending on other variables and factors.

You can measure different temperatures indoors and outdoors. If it is sunny, the temperature is likely to be higher than if it is gray. Another thing that can change the temperature is an act done for this purpose, such as lighting a fire in the fireplace. In research, we generally define variables based on what we measure.

The independent variable is the one the researcher wishes to measure (the cause), while the dependent variable is the effect (or assumed effect), dependent on the independent variable. In experimental research, these variables are often stated in a hypothesis, e.g. "what effect does personality have on helping behaviors?"

### **Operationalization**

With operationalization, it involves taking a vague concept, such as "helping behavior", and to try to measure it through specific observations, e.g. the probability that people will help a stranger in a difficult situation.