



# Tridimensional approach to research



An illustration of an iceberg floating in blue water under a blue sky with white clouds. The iceberg is divided into four horizontal sections. The top section is the smallest and is above the water line. The next section is slightly larger. The bottom two sections are the largest and are submerged. White lines with dots at the end point from the text labels to the corresponding sections of the iceberg.

**METHODS**

**METHODOLOGY**

**EPISTEMOLOGY**

**ONTOLOGY**

**Philosophical concept**    **Main question**

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Ontology                      What is the nature of reality?

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Epistemology                What can be accepted as knowledge?

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Methodology                How knowledge regarding given question can be produced?

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Methods                      What specific ways of data collection and data analysis can be used?

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Paradigm                    What are the conceptual and/or methodological models that relate to a specific discipline during a particular period of time?

# Tridimensional approach to research

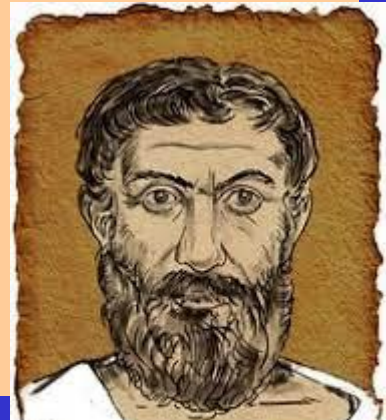
- **Ontological dimension:**
  - A set of explicit and implicit assumptions about the nature of reality and the nature of law.
  - They also include premises about assumptive modes, i.e., a position on the ways the researcher identifies, organizes, and processes legal data.
- **Epistemological dimension:**
  - It is concerned with how legal researchers create and validate knowledge and with the question of the scientific status of law.
  - Epistemological obstacles, i.e., unconscious structures that the researcher has internalized, such as obstacles related to observation, prior knowledge, generalizations, and verbal obstacles, among others, which researchers need to overcome in order to construct knowledge.
- **Methodological dimension:**
  - The general research strategies of the project, its rationale, and the analysis of each of the elements of the research process, including the methods for data collection and data analysis.

# Ontological dimension



# Ontological views: Parmenides

- Parmenides may be considered the founding father of ontology and realism.
- **Ontological realism claims that reality is objective and that it exists in the external world. It also argues that reality is independent of human minds.**
- Parmenides reacted to Heraclitus' views, who claimed that reality is continuously changing.
- For Heraclitus, all objects and people change and nothing stays the same at any given point in time. Synthesized in his famous quote “no man ever steps in the same river twice, for it's not the same river and he's not the same man”, Heraclitus advanced a conception of reality in which “the dynamic underlies even what on the surface looks like static” (Moravcsik, 1991).

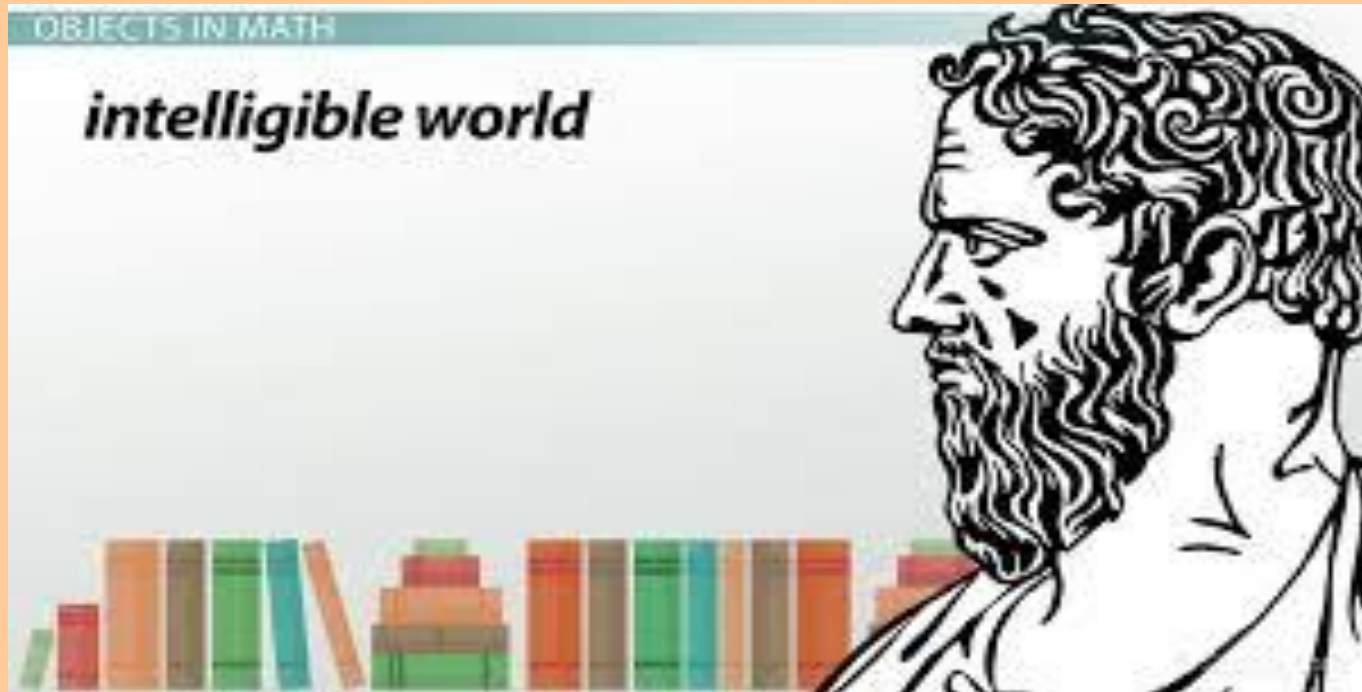


# Plato



# Ontological views: Plato

- The sensible world (things)
- The intelligible world (ideas or forms).



# Ontological views: Plato

## The sensible world (things)

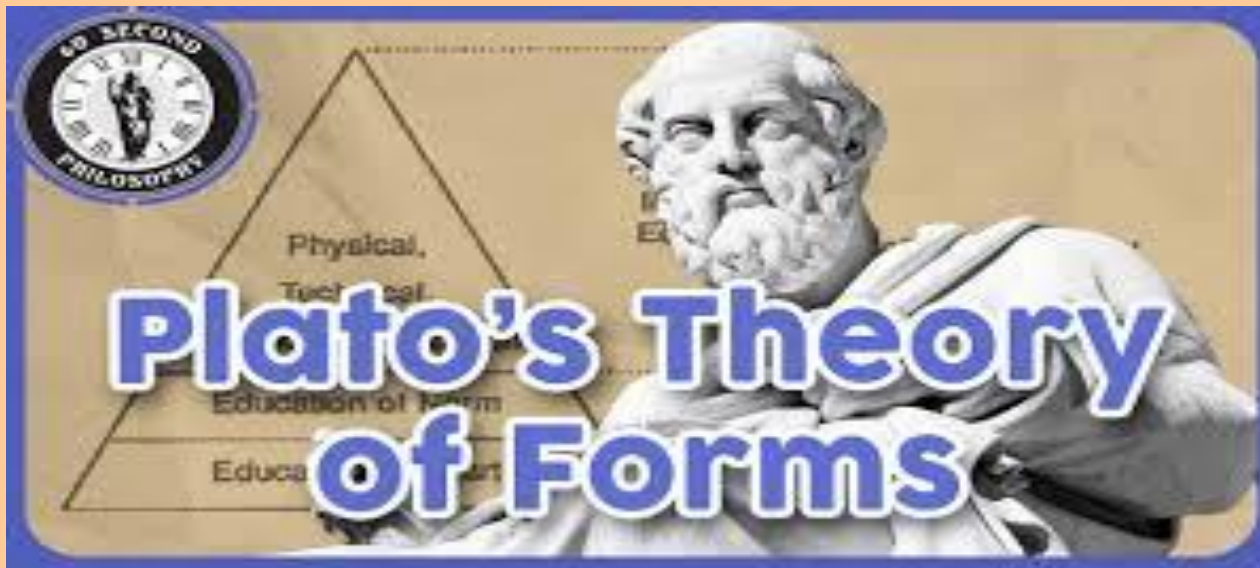
- It is the world that we experience through our senses.
- It is a shadow of the real world, a mere illusion.
  - If you see a tree, your senses are probably deceiving you. There is no certainty that it can actually exist.



# Ontological views: Plato

## The world of ideas

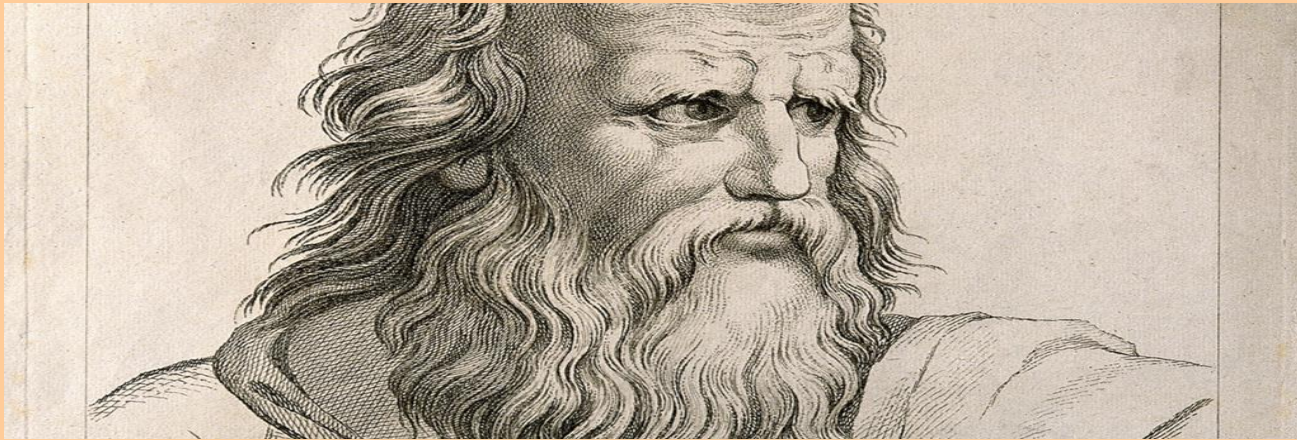
- The world of ideas is immutable, eternal, static, and true. It is not subject to a process of generation and corruption. It contains the ideas or forms that the things of the physical world imitate.
- For Plato, "being" (reality) means form, which is real in contrast to becoming, which is non-being.



# Ontological views: Plato

## The world of ideas and the world of things

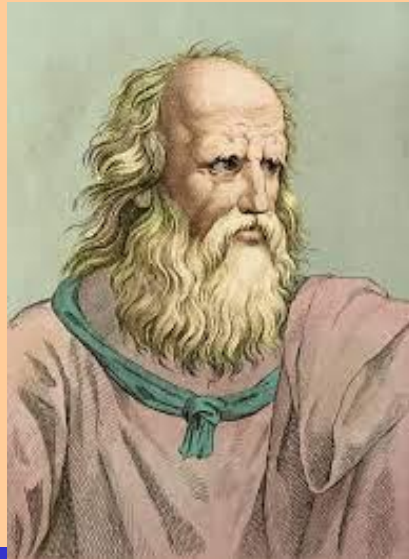
- The world of things is imperfect and is made up of inadequate instantiations of the forms under which they are located.
- For an object to exist it must instantiate or participate in these forms. In other words, each material object has its own corresponding form, which is not embodied in the object itself, but separate from it.



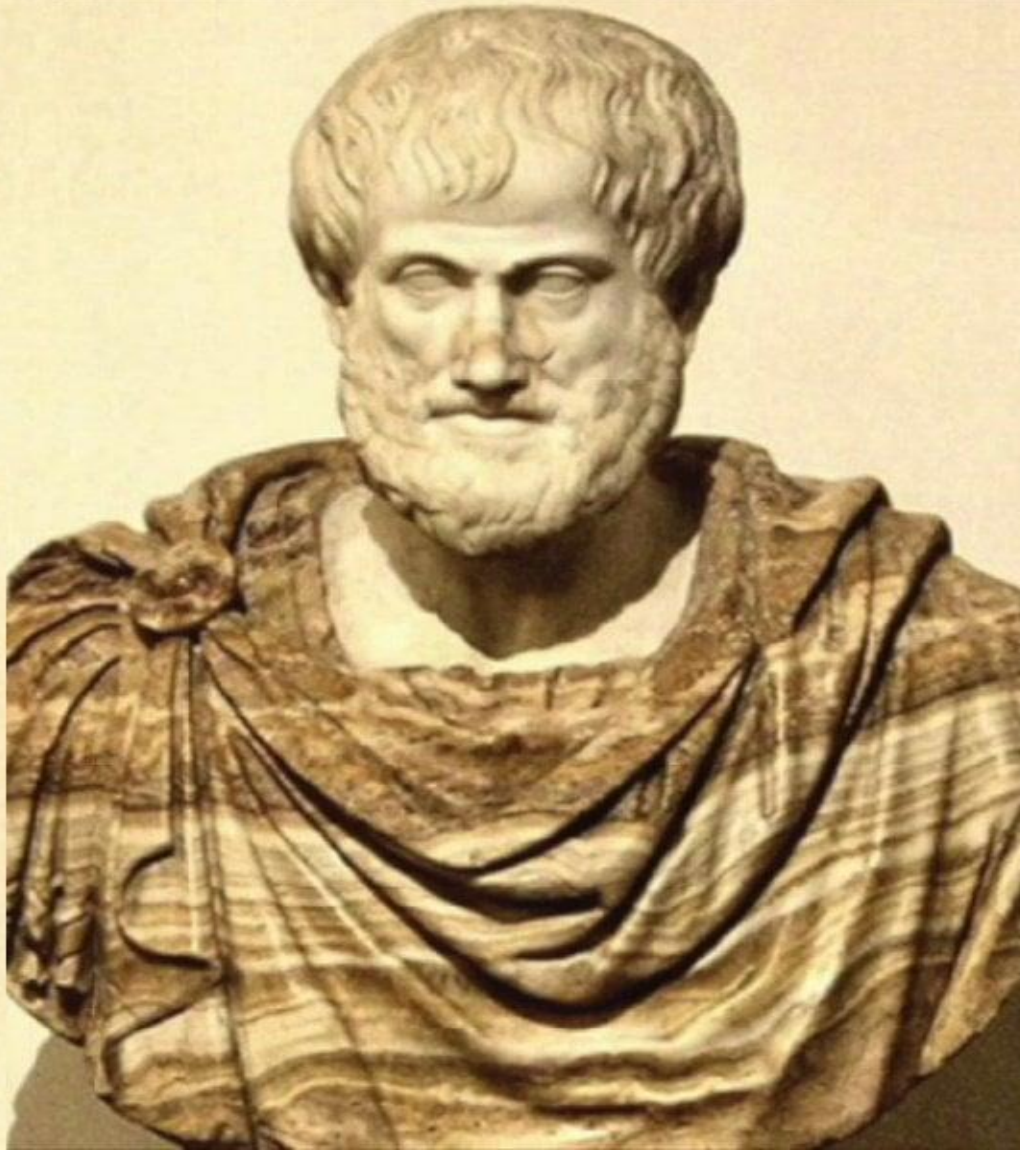
# Ontological views: Plato

## Do empty forms exist?

- An empty form is a form that does not correspond to anything in particular, e.g., a perfect legal system.
- Empty forms may be circumstantially empty or necessarily empty.
- Circumstantially empty: those forms that can be empty at present but were instantiated in the past or can be instantiated in the future.
- Necessarily empty: those that cannot possibly ever be instantiated such as a real utopia or an infinite finite.



# Aristotle



# Ontological views: Aristotle

- The true world is the world of the senses.
- The essence of things does not reside in a separate world, but in themselves, in their matter and their form.
- The two Platonic worlds become two dimensions present in every sensible being, two faces of the same reality: matter and form.
- There is only one world, the sensible one. This world is intelligible.
- Aristotle's world is two-dimensional.
- Aristotle's ontology is based on the argument that reality exists in the sensible world and it is based on particulars, on individual substances, which share universal commonalities. The universal is not separate from a particular but inherent in it.

# René Descartes



# Ontological views: Descartes

- Through systematic doubt, Descartes concludes that we are thinking substances.
- This view is different from the Aristotelian, realistic conception who recognized the existence of things independently of thought.
- Descartes wonders if things in reality exist or if they are the product of thought. He doubts the existence of these things outside of thought, because no thought is a guarantee of a reality external to thought.
- However, Descartes is a dualist. He rejects the idea that only one's mind exists and recognizes the existence of the external world.

# George Berkeley



# Ontological views: George Berkeley

- There are only two kinds of existences: ideas, which are passive and dependent, and spirits, which are active.
- God is the supremely active spirit, who has created everything else.
- Berkeley's ontology denies the reality of material things and rejects the Cartesian concept of extension. For Berkeley, the world only exists in the act in which the infinite, divine mind creates it or the finite, human, mind perceives it.
- Thus, Berkeley argues that to be is to be perceived.
- Berkeley does not recognize the existence of substance. For him, there are only minds which perceive.

# John Locke



# Ontological views: John Locke

- Locke is a materialist. He recognizes the objective existence of things and considers that our ideas and representations are the result of the action of these things on our sensory organs.
- Empirical, sensory character of human knowledge.
  - External experience or sensation: the action of material objects on the sensory organs. Therein lies Locke's materialism.
  - Internal experience or reflection: ideas are received by an inner sense, i.e., the mind's awareness of its own activities, which makes us conscious of the mental processes we are engaged in. Thus, the self is identical with consciousness, which is accessible empirically and accompanies all acts of thinking, reasoning, reflecting, and identity.

# David Hume



# Ontological views: David Hume

- Hume's empiricist ontology admits only one type of entity: perceptions, which he divides into two classes: impressions and ideas.
- Impressions: the immediate data of external or internal experience (sensations, feelings, sentiments). They are vivid and there is a sense of reality. Impressions are the irreducible and fundamental perceptions that we call sensations, passions and emotions.
- Ideas: the mediate contents, reproduced or derived from impressions, They are weaker and less lively. Ideas are "the blurred images of sensations in thought and reasoning".
- Thought and reasoning emerge from the ability to form images and that imagination is a kind of blurred copy of sensations and feelings. Thus, thinking is reduced to compounding, transporting, augmenting, or diminishing the materials afforded us by the senses and experience. There is a secret tie or union among particular ideas, which causes the mind to conjoin them more frequently, and makes the one, upon its appearance, introduce the other.

# Immanuel Kant



# Ontological views: Kant

- Objects exist in the external world, even if we are unable to access them as they really exist outside our minds.



# Ontological views

Monism

Dualism

Idealism

(mind)

Subjective

Objective

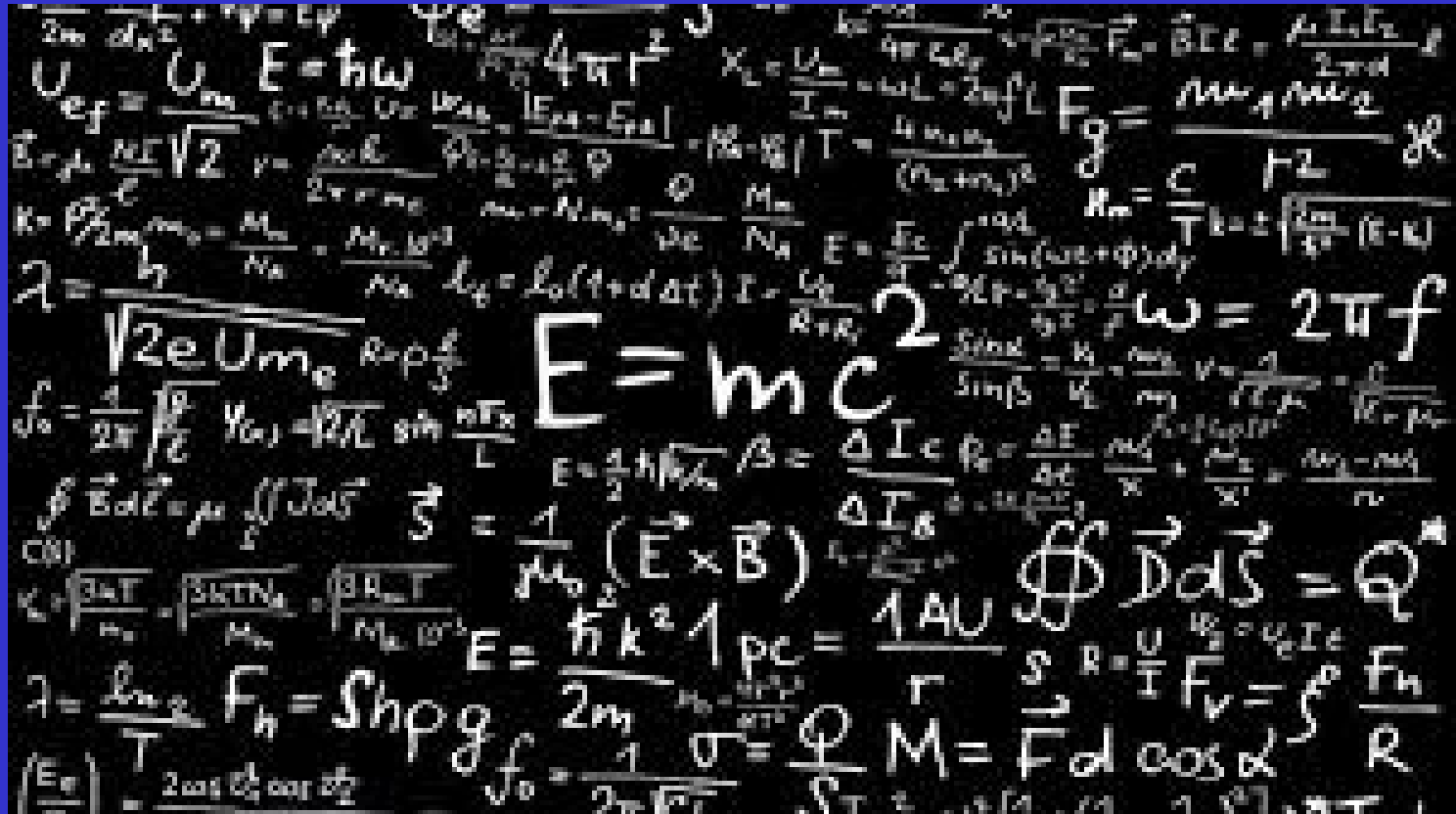
(Plato)

Materialism:

objective  
existence of  
things  
(Locke &  
Hume)

Mind and  
matter exist as  
independent  
substances  
(Aristotle)

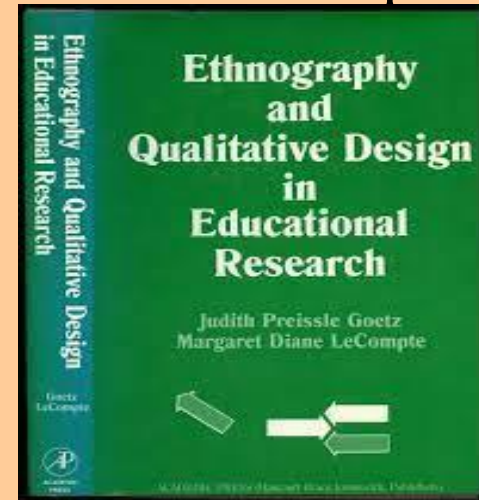
# Assumptive modes



# Assumptive modes

The decisions about assumptive modes reflect the premises and assumptions of the researcher about reality and the way of understanding it. They imply a position on the ways of identifying, organizing, and processing the data and the ideas that explain them.

- Induction vs. deduction.
- Generation vs. verification.
- Construction vs. enumeration.
- Subjectivity vs. objectivity.



These logical pairs do not constitute a dichotomy, but are formulated as a continuum and all research is located at one points of this continuum.

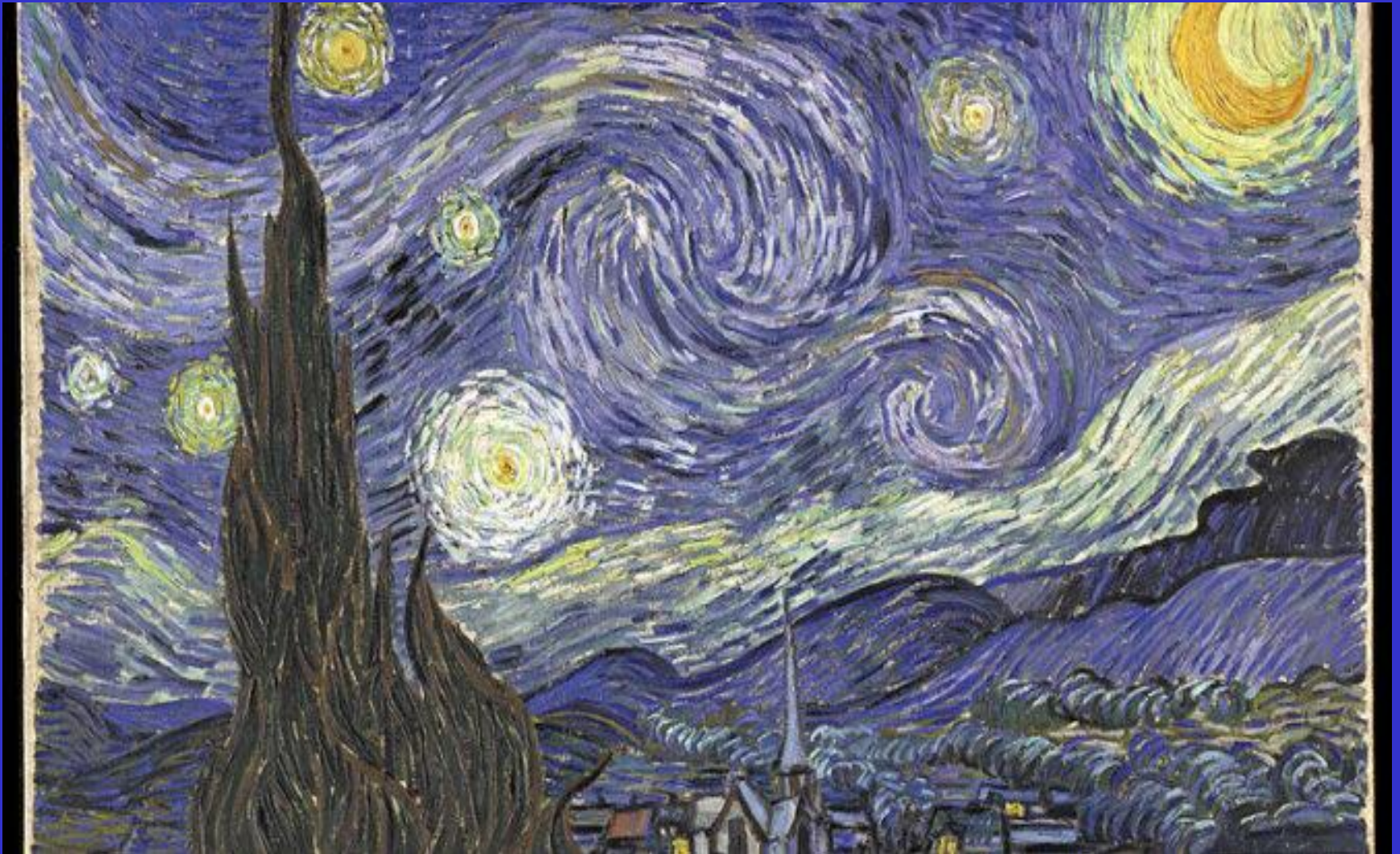
# Assumptive modes

- Induction vs. deduction
  - It identifies the place of theory in research. Deductive research begins with theory, operationalizes it, and tries to relate it empirically to data.
  - Inductive research begins with data collection and proceeds to establish theoretical categories or relationships between the data.
- Generation vs. verification
  - Generative research aims to discover constructs and propositions from empirical data. It is generally inductive and can even start without a concrete theory.
  - Verification research aims to test propositions, develops evidence so that the hypothesis can fit the data, and generalizes beyond the study in question.

# Assumptive modes

- Construction vs. enumeration
  - This mode refers to the ways of formulating the units of analysis of a study.
  - Constructive strategies discover constructions or categories of phenomena during the course of the observation.
  - Enumeration strategies anchor predefined units of analysis up to systematic counting.
- Subjectivity vs. objectivity.
  - The subjective-objective continuum refers to the conception of reality, which influences the research objectives and the research product.
  - The studies that tend to gravitate toward the subjective end try to describe the categories or constructions that the subjects use to describe their own experiences.
  - The objective approach applies concepts for data analysis that are external to the subject's experiences.

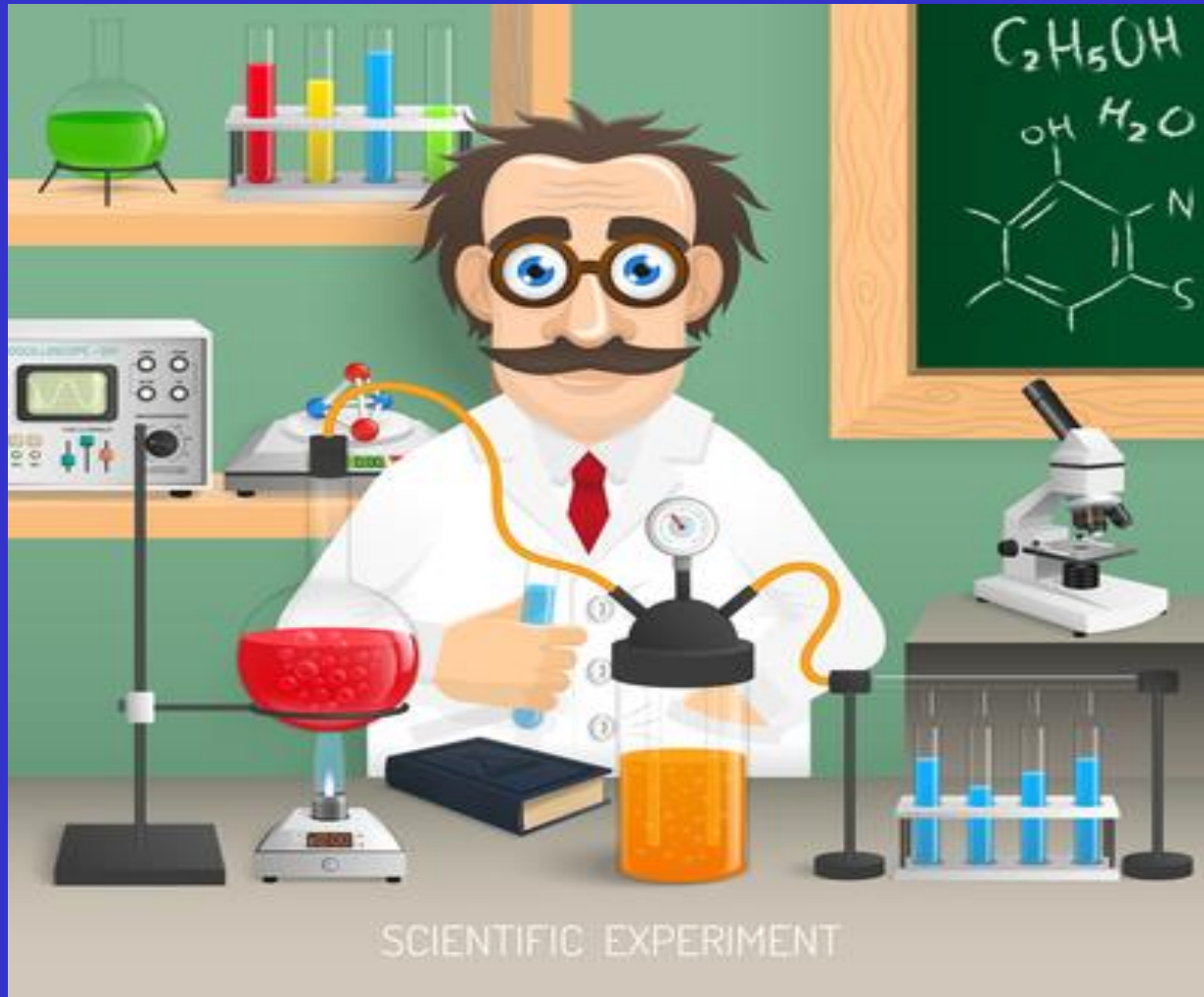
# Epistemological dimension



# Epistemological dimension

- The scientific status of the discipline.
  - What is science?
  - Is Law science?
- Epistemological obstacles (Bachelard). Idols of the Mind (Bacon).
- Production and justification of knowledge: The epistemological contexts
  - Context of discovery: The creation of knowledge in the discipline.
  - Context of justification: The validation or justification of knowledge in the discipline.
  - Context of application: legal practice

# Science



# Origins of modern science



# Origins of modern science

- Modern science was born in the early 17th century when the observation of facts became the basis for science.
- Before that knowledge was based on authority, e.g., the Bible or Aristotle.

**Two schools of thought: Knowledge should be derived from the facts of experience arrived at by observation**

- Empiricists (David Hume, John Locke).
- Positivists (Vienna Circle 1920's)



# Modern Science: Bacon (1561-1626)

- Bacon proposed inductive logic to replace Aristotelian methods (deductive logic) and gave a much more central role to experience and experiments.
- Bacon's method rests on two pillars:
  - Observation.
  - Induction.



# Modern Science: Bacon (1561-1626)

- **Observation** is supposed to be undertaken without prejudice or preconception, and we are to record the results of the data of sensory experience, what we can see, hear, and smell, whether of the world as we find it, or of the special circumstances of our experiments.
- The results of observation are expressed in what are called **observation statements**. Once we have made a whole host of observations these are to be used as the basis for scientific laws and theories. Many scientific laws are of the form of what are called universal generalisations; these are statements that generalise about the properties of all things of a certain kind.
- **Observations** must be free from the influence of the first three

# Modern Science: Bacon (1561-1626)

- **Induction.**

- It is the form of reasoning where we generalise from a whole collection of particular instances to a general conclusion.
- This involves studying all the information displayed in the tables and finding something that is present in all instances of the phenomenon in question, and absent when the phenomenon is absent, and furthermore, which increases and decreases in amount in proportion with the increases and decrease of the phenomenon. The thing that satisfies these conditions is to be found by elimination and not by merely guessing.
- **The forms of things.** Science must discover the forms of things, i.e., the immediate causes or the general principles or laws that govern phenomena in the material world.

# Modern Science: Bacon (1561-1626)

- **The composition of a Natural and Experimental History.** The idea is to reach the truth by gathering a mass of information about particular states of affairs and building from them step by step to reach a general conclusion.
- **Experiments** are important because if we simply observe what happens around us we are limited in the data we can gather; when we perform an experiment we control the conditions of observation as far as is possible and manipulate the conditions of the experiment to see what happens in circumstances that may never happen otherwise. Experiments allow us to ask ‘what would happen if . . .?’.
- **Repeatable experiments.** Experiments have to be repeatable so that others can check the results obtained. Data must be included in tables of various kinds.

# Science: Empiricism and Positivism



# Predominant modern notion of science

- Science knowledge derived from the facts of experience through observation.
  - Not derived from personal opinion.
  - It is a rational activity operating according to some special method.

## Elements of science

- Facts (known through observation)
- Logical reasoning (derived from facts)



# Facts

Facts are presumed to be claims about the world that can be directly established by a careful, unprejudiced use of the senses.

Science is to be based on what we can see, hear, and touch rather than on personal opinions or speculative imaginings.

## Assumptions

- Facts are directly given to careful, unprejudiced observers via the senses.
- Facts are prior to and independent of theory.
- Facts constitute a firm and reliable foundation for scientific knowledge.

# Facts

- Two individuals can see the same thing but interpret what they see differently.
- One person can see something different at different times.
- Observable facts are expressed as statements.
  - Observation statements are not given to observers via the senses.
- Theory precedes facts. Facts do not precede theory.
  - We need a theory to be able to observe (e.g., child naming an apple).
- Perceptions are influenced by the background and expectations of the observer.
  - What appears to be an observable fact for one need not be for another.
- Judgments about the truth of observation statements depend on what is already known or assumed, thus rendering the observable facts as fallible as the presuppositions underlying them.

# Deriving theories from facts

## Inductivism or induction



- **Inductivism** in its most crude and naive form says we can generalize from a collection of observations to a general conclusion.
- When we observe a large number of Xs under a wide variety of conditions, and when all observed Xs have been found to cause Y, then naive inductivism says that it's logically valid to say that *all* Xs cause Y.
- Example: Every book on science has more than 300 pages in a random sample of 200 books. This strongly supports the following conclusion: All books on science have more than 300 pages.

# Critique of induction

## Conditions

1. The number of observations forming the basis of generalizations must be large.
  - Large is a very vague concept.
2. The observations must be repeated under a wide variety of conditions.
  - Each inductive argument involves an appeal to prior knowledge, which needs an inductive argument to justify it, which involves an appeal to further prior knowledge and so on in a never-ending chain.
3. No accepted observation statement should conflict with the derived law.

# Critique of induction

## Other problems

- Much of knowledge refers to the unobservable.
- An attempt to justify induction by an appeal to experience involves assuming what one is trying to prove. It involves justifying induction by appealing to induction, which is not reasonable.

The principle of induction worked on occasion X1.

The principle of induction worked on occasion X2.

---

The principle of induction always works.

# Explication of conceptions (Whewell)

- There is a new element added to the combination of instances by the very act of thought (colligation) by which they were combined'
- **Colligation** is the mental operation of bringing together a number of empirical facts by 'superinducing' upon them a conception which unites the facts and renders them capable of being expressed by a general law. The conception provides the 'true bond of unity by which the phenomena are held together', by providing a property shared by the known members of a class.
- This is important because the fundamental ideas and conceptions are provided by our minds, but they cannot be used in their innate form.

# Explication of conceptions (Whewell)

- The ideas are in the human mind before experience; but by the progress of scientific thought they are unfolded into clearness and distinctness. This 'unfolding' of ideas and conceptions as the 'explication of conceptions.' Explication is a necessary precondition to discovery, and it consists in a partly empirical, partly rational process.
- Scientists first try to clarify and make explicit a conception in their minds, then attempt to apply it to the facts they have precisely examined, to determine whether the conception can colligate the facts into a law.
- If not, the scientist uses this experience to attempt a further refinement of the conception. Whewell claimed that a large part of the history of science is the 'history of scientific ideas,' that is, the history of their explication and subsequent use as colligating concepts.

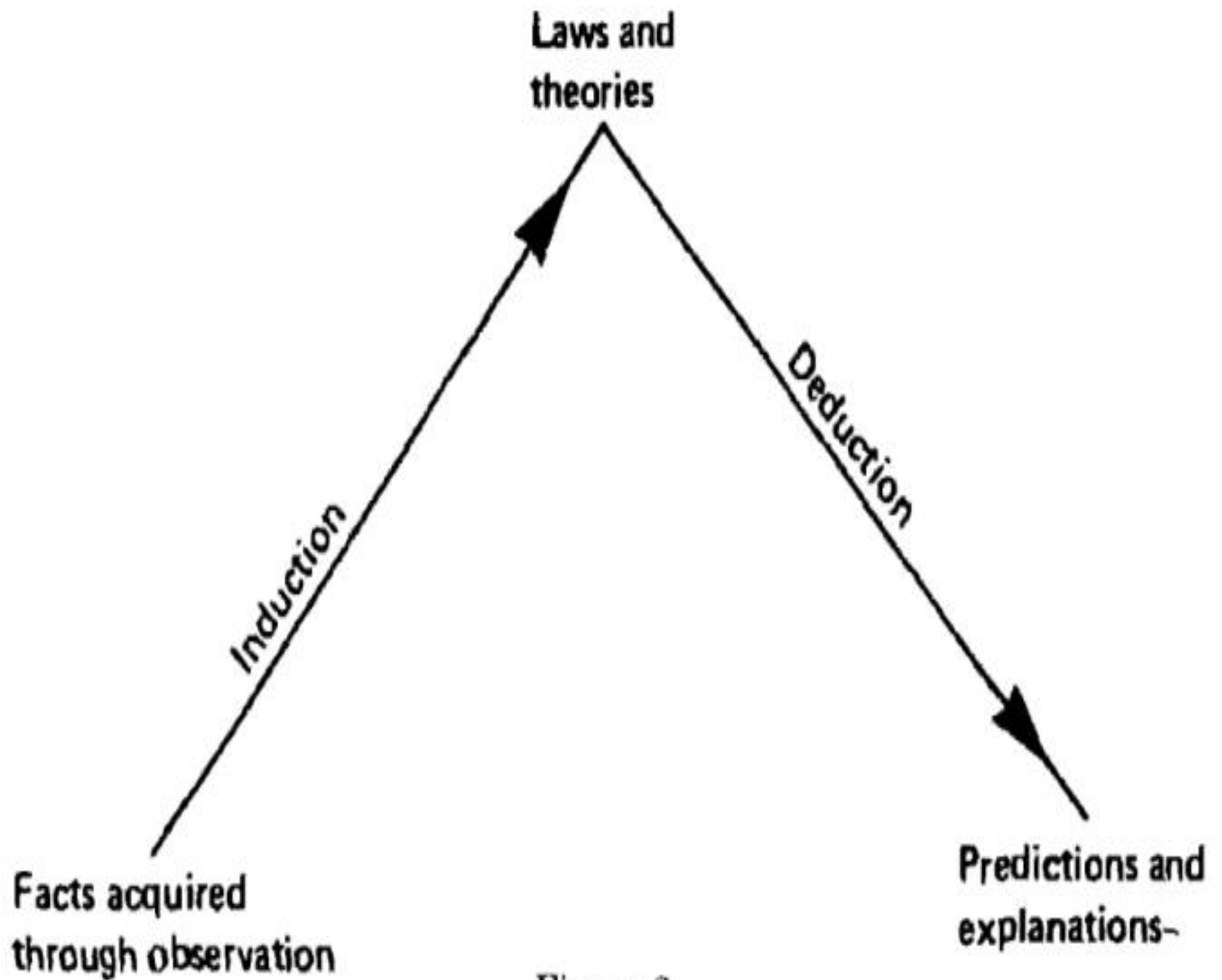


Figure 2

# Deductive reasoning

All men are mortal.

Aristotle is a man.

---

Aristotle is mortal.

All dogs have five legs.

Tiffany is a dog.

---

Tiffany has five legs.

Deductive logic can yield to absurd results.



# Deductive reasoning

Similarly, not all invalid arguments are intuitively bad arguments. For example:

Jimmy claims to be a philosopher.  
I have no reason to believe he is lying.

---

Therefore Jimmy is a philosopher

This argument is persuasive but invalid.

**INDUCTIVE**  
reasoning **vs** **DEDUCTIVE**  
reasoning

No matter how unrealistic that sounds, in many fields, such as science and law, "proof" simply doesn't exist; there can only be facts and evidence that lead you to certain conclusions.

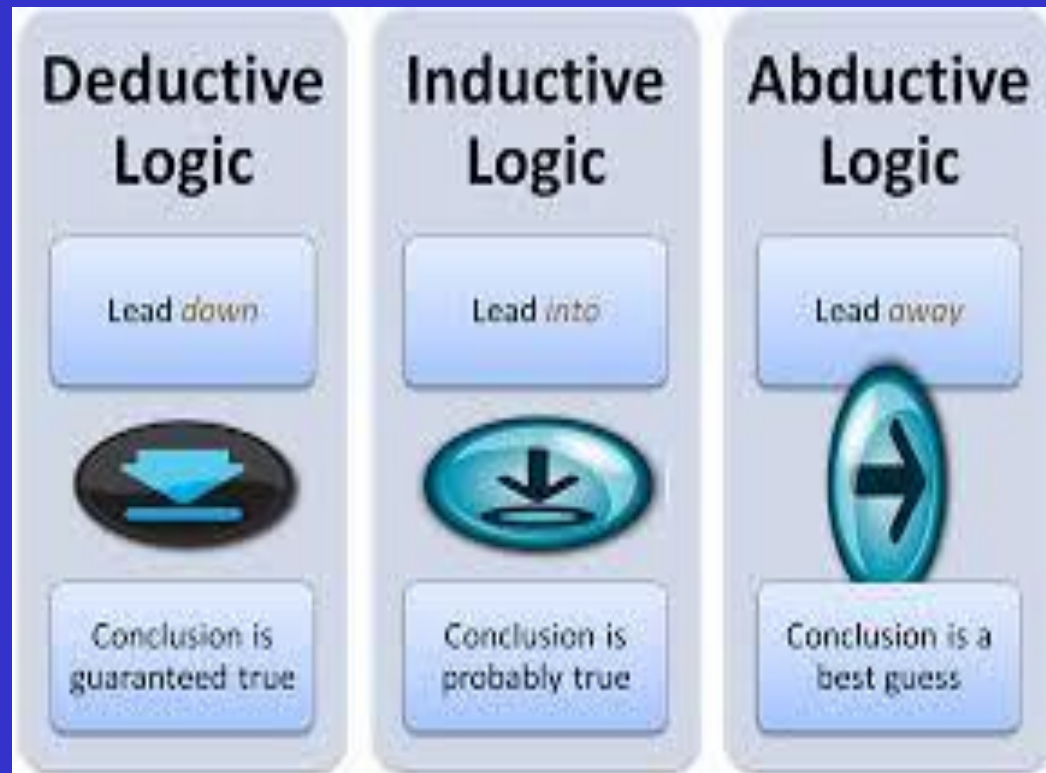
## INDUCTIVE REASONING

- Someone who uses **INDUCTIVE** reasoning makes specific observations and then draws a general conclusion.

## DEDUCTIVE REASONING

- **DEDUCTIVE** reasoning is a specific conclusion follows a general theory.

# Comparison of logical reasoning methods

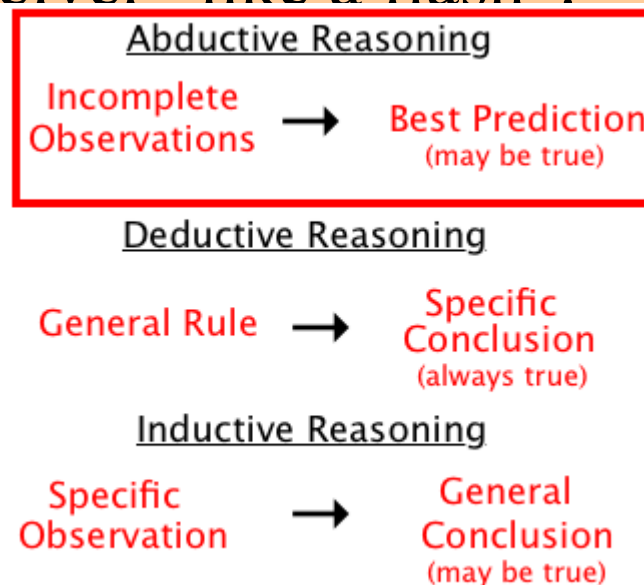


# Abductive reasoning



# Abductive reasoning

- Peirce's original idea focused on the fact that the human mind makes inferences based on intuitions and associations, combining the observation of a new phenomenon with already internalised background knowledge.
- The inference that explains the new phenomenon then comes to the perceiver "like a flash".



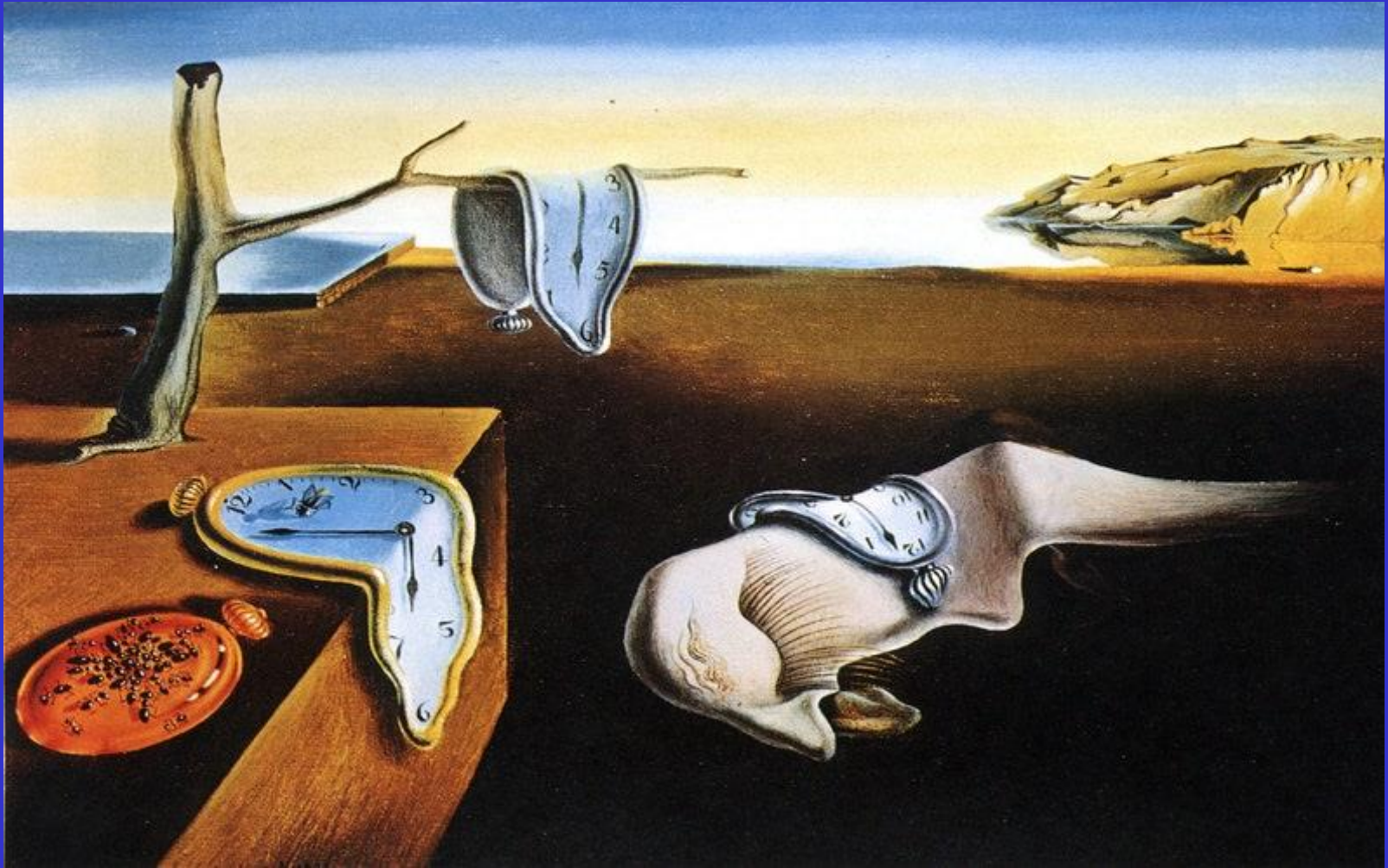
# Abductive reasoning

- In abductive approach, the research process starts with ‘surprising facts’ or ‘puzzles’ and the research process is devoted their explanation.
- Abductive reasoning starts from the description of an event or phenomenon and generates a hypothesis, which explains, abductively inferring, the event or phenomenon and the existence of underlying causal mechanisms.
- In Peirce's terms, “abduction is the process for the formation of explanatory hypotheses and constitutes the only logical operation that allows the introduction of a new idea.”
- Abducting reasoning can be used to create a new theory.

# Examples of abductive reasoning

- Einstein's work was not just inductive and deductive, but involved a creative leap of imagination and visualization that scarcely seemed warranted by the mere observation of moving trains and falling elevators. In fact, so much of Einstein's work was done as a "thought experiment".
- A medical diagnosis is an application of abductive reasoning: given this set of symptoms, what is the diagnosis that would best explain most of them?
- When jurors hear evidence in a criminal case, they must consider whether the prosecution or the defense has the best explanation to cover all the points of evidence.

# Epistemological obstacles



# Epistemological obstacles

- Unthought/unconscious structures that are immanent within the realm of the sciences. The act of knowing causes the stagnation of the evolution of scientific thought
- The history of science consists of the formation and establishment of these epistemological obstacles and the subsequent tearing down of these obstacles. This latter stage is an epistemological rupture—where an unconscious obstacle to scientific thought is thoroughly ruptured.
- One of the tasks of epistemology is to make clear the mental patterns at use in science in order to help scientists overcome the obstacles to knowledge.
- Most of the obstacles are psychological and are in the mind of the researcher, in their preconceptions and biases, which must be overcome in order to advance in the process of seeking knowledge.

# Bacon: Idols of the Mind

- Idols are prejudices, fallacies, or obstacles, common to mankind, which do not accurately reflect the nature of reality, and which subjugate understanding.
- They come from baseless opinions guided by the senses. They are derived from each person's beliefs, a product of their education, habits, and customs;. They come from the abuse of language, where the force of the word is imposed on the thought generating disturbing ideas. They come from false philosophical, theological and traditional systems that is nothing more than a fable staged.

# Bacon: Idols of the Mind

- The tendency of all human beings to perceive **more order and regularity in nature** than there is in reality.
- The Idols of the Cave are individual weaknesses in reasoning due to **particular personalities and likes and dislikes**.
- The Idols of the Marketplace are the confusions engendered by our received **language and terminology**, which may be inappropriate yet which condition our thinking.
- The Idols of the Theatre are the **philosophical systems** that incorporate mistaken methods, such as Aristotle's, for acquiring knowledge.

# Epistemological obstacles: Bachelard

1. The first experience.
2. General knowledge
3. The verbal obstacle.
4. The obstacle of unitary and pragmatic knowledge.
5. The substantialist obstacle.
6. The realism obstacle.
7. The animist obstacle
8. The myth of digestion.
9. The libido and objective knowledge
10. Obstacles to quantitative knowledge.



# Epistemological obstacles

- **The first experience.**

- The first that must be overcome is that of the first experience, made up of information that is perceived and lodged in the spirit, generally in the first years of intellectual life that could not be subjected to any criticism. In this obstacle lies the importance of early education on the phenomena of nature, which must be taught on a strictly scientific basis, with metaphors but explained scientifically, understandable, and pleasant to the student.

- **General knowledge.**

- The exaggerated and unsubstantiated generalization. A range of phenomena is encompassed in a single group of concepts, associating them in an arbitrary way, often reinforcing a conceptual error existing in common sense. This obstacle immobilizes the thought, accommodates the senses, and gives inertia to the evolution of concepts.



# Epistemological obstacles

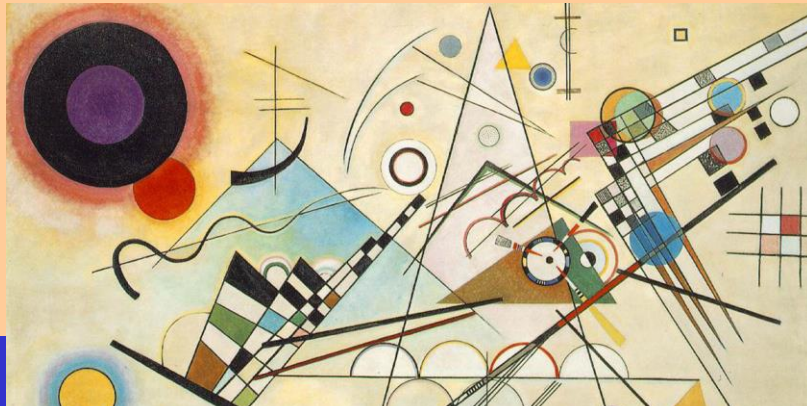
- **The verbal obstacle.**

- The interference that a simple word can cause in the understanding of a concept. The wrong understanding of a word can lead to a scientific mistake. Bachelard warns that the verbal obstacle is directly related to the generalization by inducing concepts of different phenomena starting from a single word or image.
- Another resource used in understanding science that can become a verbal obstacle is the metaphors and analogies. According to Bachelard, the danger of immediate metaphors for the formation of the scientific spirit is that neither they are always passing images; lead to autonomous thinking; tend to complete itself, to complete itself in the realm of the image.



# Epistemological obstacles

- **The obstacle of unitary and pragmatic knowledge.**
  - This obstacle concerns pre-scientific knowledge that is based on the unity to make reciprocity inferences. In this thought, everything that describes the general can describe the specific, everything that describes the macro can describe the micro, and vice versa.
  - In this conception, unity is insistently sought and its seduction lies in the fact that, with it, we can make predictions without cognitive effort.
  - For the scientific spirit, unity is a principle that is always desired, always effortlessly accomplished.
  - The various natural activities thus become varied manifestations of one and only Nature.
  - This need for unity brings a multitude of false problems.



# Epistemological obstacles

- **The substantialist obstacle.**

- When we attribute different characteristics to a concept, we limit ourselves to the external aspects without taking into account the intrinsic aspects of the concept.
- It is made up of diverse and even opposing intuitions. The pre-scientific spirit condenses into an object all knowledge in which this object plays a role, without taking into account the hierarchy of empirical roles.
- In order to overcome this obstacle, you cannot be limited to superficial relationships between phenomena and objects, you must seek the real justifications for the phenomenon.

- **The realism obstacle.**

- The use of analogies and metaphors of concrete concepts to express something that is abstract. Thus, the concrete becomes more effective and conclusive than the abstract.
- This thinking is so resistant that realism can be considered the only innate philosophy.

# Epistemological obstacles

- **The animist obstacle**
  - It is common to make use of animist resources to refer to inanimate phenomena.
  - This preference for biological phenomena gives them a value that overrides other spheres of knowledge, giving the illusion that the vitalization of concepts is capable of bringing them closer to the researcher.
- **The myth of digestion.**
  - An important factor for learning is the internalization of concepts. However, you can create a false idea of internalization of the real.
  - The digestion of knowledge implies having knowledge as a possession. The function of possession is very apparent in certain pre-scientific texts.
  - It is easy to see, in everyday life, this privilege of solid and of the mass.

# Epistemological obstacles

- **The libido and objective knowledge**

- There is a relationship between the myth of digestion and the concept of libido.
- The appetite is more brutal, but the libido is more powerful. The appetite is immediate. The libido, however, concerns long-term projects and thoughts.
- The libido, as soon as it has been satisfied, reappears.
- Everything that lasts in us, directly or indirectly, is linked to libido.
- Libido consists in the evidentialization of the subject's relationship with another subject, which pushes into the background the relationship between the subject and the object in which the phenomenon is observed.
- This sexualized relationship of scientific phenomena reflects a symptomatic view of science with concepts such as: pure and impure substance and impure, good and evil, among others

# Epistemological obstacles

- **Obstacles to quantitative knowledge.**
  - There is an exacerbated urge to quantify and measure.
  - In the urge to seek precision when measuring, the essence of what is being measured is lost.
  - The method used in the measurement take away from the possibility of building a critical sense of analysis, including what should be discarded and what should be taken into account in the quantitative analysis and measurement of a phenomenon.
  - Measuring devices themselves are subject to inaccuracy.



# Karl Popper

THE  
KARL POPPER



All life is problem solving

OF THE  
POPPER

# Positivism: Falsifiability (Popper)

- Science is a set of **falsifiable** hypotheses that are tentatively proposed with the aim of accurately describing or accounting for the behaviour of some aspect of the world or universe.
- A hypothesis is falsifiable if there exists a logically possible observation statement that is inconsistent with it.
- The Falsification Principle, proposed by Karl Popper, is a way of demarcating science from non-science. It suggests that for a theory to be considered scientific it must be able to be tested and proven false. For example, the hypothesis that "all swans are white," can be falsified by observing a black swan.

Examples of statements that are falsifiable.

- It never snows in summer. The Eiffel Tower is taller than the CN tower.

Examples of statements that are not falsifiable.

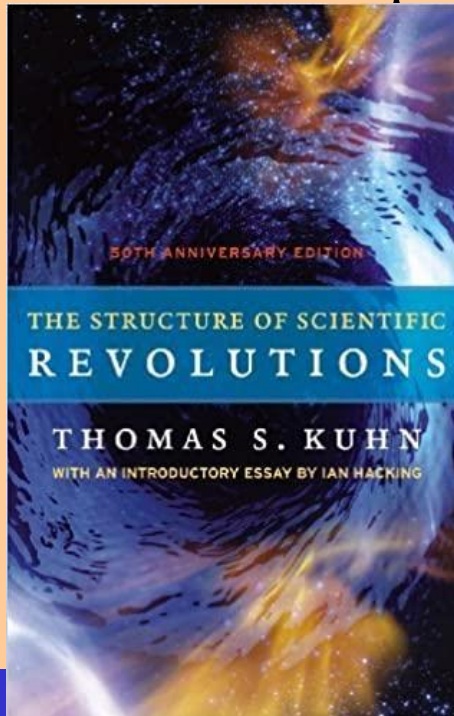
- Either she is happy or unhappy. Luck is possible in a love relation.
- Falsification is inadequate on historical grounds.

# Kuhn and the Scientific Revolution



# Kuhn: Paradigms

A mature science experiences alternating phases of normal science and revolutions. In normal science the key theories, instruments, values and metaphysical assumptions that comprise the disciplinary matrix are kept fixed, permitting the cumulative generation of puzzle-solutions, whereas in a scientific revolution the disciplinary matrix undergoes revision, in order to permit the solution of the more serious anomalous puzzles that disturbed the preceding period of normal science.



# Kuhn

- Science assumes that there is only one truth about a given subject, for example that the laws of gravity are universal and do not change on Thursdays or when you are on Mars.
- Science historian Thomas Kuhn described how a single truth or paradigm dominates a field of science at any one time, and that serious change in science occurs as one paradigm competes with (and overcomes) another. For example Newton's laws held sway for many years until they were shown not to apply in sub-atomic situations. Quantum physics arose as an explanation of what happens in these microscopic situations.

## **Pre-paradigmatic stage**

- In the pre-paradigmatic stage there is confusion as multiple paradigms are put forward by different schools of thought. Scientists may disagree vociferously with one another as they propose and support their individual theories.
- Over time, as the ideas compete, scientists cluster around a small set of paradigms (often two), each trying to support their own ideas and destroy the opposing paradigms. Eventually, one paradigm wins through and becomes the dominant principle.

# Kuhn

## Normal science

- Most science is 'normal science', in which scholars accept the dominant paradigm of the day, performing experiments that test and prove its efficacy in a range of situations. New explanations may extend the paradigm but do not change its fundamental nature.
- In this way, the paradigm may grow with many extensions to explain the various exceptional cases that are not easily covered by the original paradigm.

## Extraordinary science

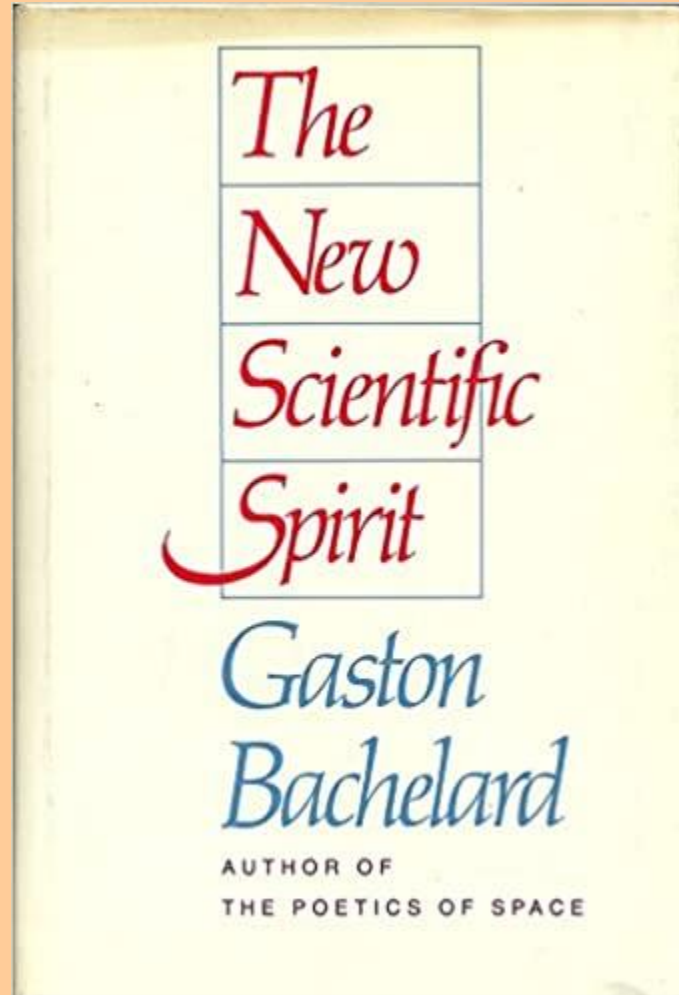
- Eventually a new paradigm is explored and proposed which challenges the existing paradigm. New methods may be used as new theories are proposed and proven. This work is outside of the canon of normal science and assumes that the dominant paradigm is probably not fully true in certain circumstances.

# Concept of science



# Notion of science

- Influential authors (French epistemological tradition)
- Althusser
- Bachelard
- Bourdieu
- Khun
- Laudan
- Feyerabend



# Notion of science

There is science when members of a disciplinary community, grouped around a common paradigm or a research tradition, recognize their disciplinary practice as scientific and are engaged in institutional social practices that members of other communities that also recognize themselves as scientific are engaged in, such as research, peer-reviewed publications in journals and books, participation in conferences, and university teaching, among others.

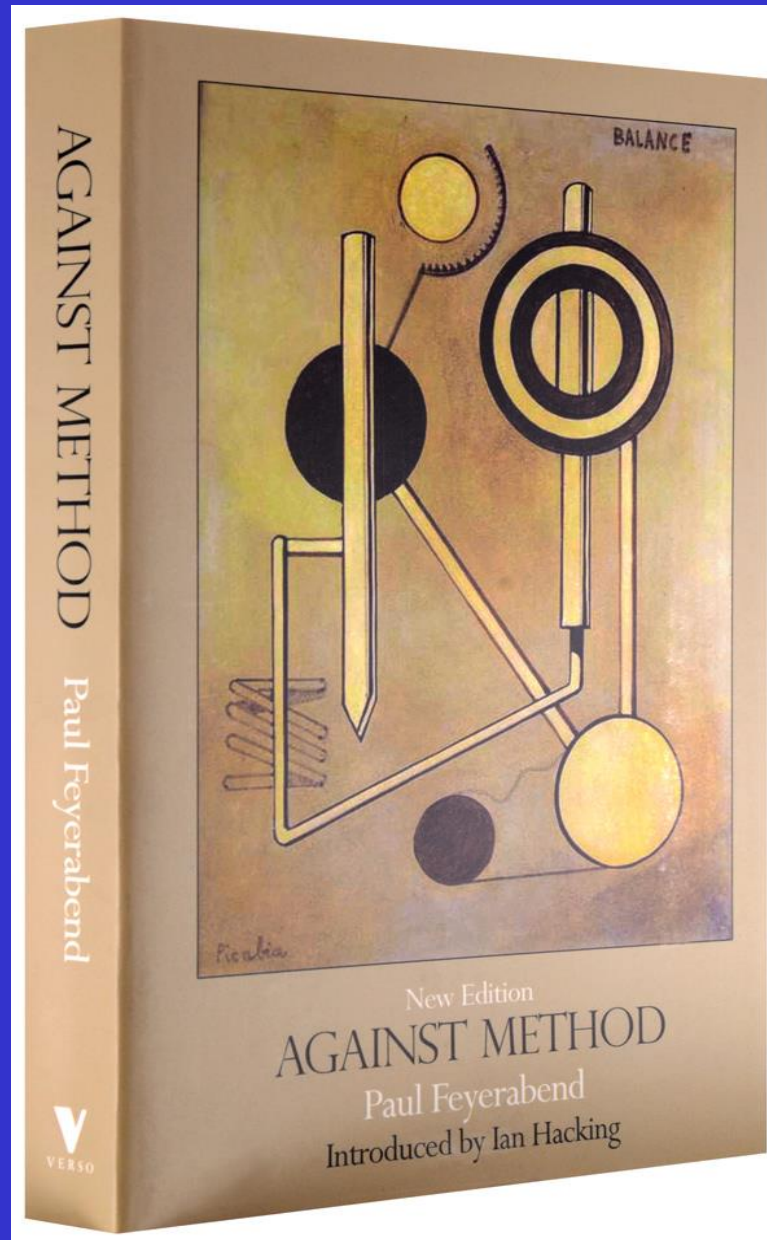
Thus, science –even the so called natural sciences- is a social construction; and scientific knowledge is epistemologically conquered, constructed, consented, and watched, which implies a break with respect to previous knowledge.

It may include the recognition of other scientific communities, which may be fulfilled with the recognition of some –but not necessarily all- scientific communities.

# Science. Elements of its definition

- Disciplinary community.
- Common paradigm (Kuhn) or research tradition (Laudan).
- Recognition that the disciplinary practice is scientific by the members of the community of practice.
- Institutionalization of practices.
- Social practices similar to other scientific communities.
- Social practices: research, peer-reviewed publications, conferences, and university teaching.
- Social construction.
  - Knowledge is constructed, consented among members of the disciplinary community.
- Epistemological break (Bachelard).
- Epistemological watch (Bourdieu & Bachelard).
- May include social recognition by other scientific communities (Follari).

# Feyerabend: Against Method



# For Science

- There is something special about science and its methods.
- Science is held in high regard.
- Ads assert that a particular product has been scientifically shown to have certain characteristics (more potent, whither, more sexually appealing than its rival products).
- Science is essentially a problem solving activity.

# Against Science

- Science has no special features that render it intrinsically superior to other kinds of knowledge such as ancient myths or voodoo.
- A high regard for science is seen as a modern religion, playing a similar role to that of Christianity in Europe in earlier eras.
- Choices between scientific theories boil down to choices determined by the subjective values and wishes of individuals.

# Against Method (Paul Feyerabend)

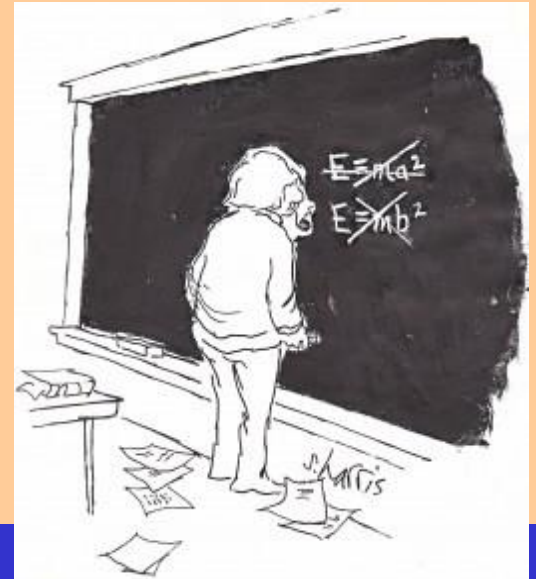
- Events, procedures, and results that constitute sciences have no common structure; there are no elements that occur in every scientific investigation but are missing elsewhere.
- Science cannot be used as an argument for treating as yet unresolved problems in a standardized way.
- Non-scientific procedures cannot be dismissed.
- Sciences must be protected from ideologies. And societies, especially democratic societies, must be protected from science.
- The profits of science should never be imposed. They should be examined and freely accepted by the parties of the exchange.
- In a democracy, scientific institutions, research programs, and suggestions must be subjected to public control. There must be a separation of state and science just as there is separation between state and church.
- Science should be taught as one view among many and not as the only road to truth and reality.

# Against Method

- Science is an essentially anarchic enterprise: theoretical anarchism is more humanitarian and more likely to encourage progress than its law-and-order alternatives.
- This is shown both by an examination of historical episodes and by an abstract analysis of the relation between idea and action. The only principle that does not inhibit progress is: anything goes.
- For example, we may use hypotheses that contradict well-confirmed theories and/or well-established experimental results. We may advance science by proceeding counterinductively. The consistency condition which demands that new hypotheses agree with accepted theories is unreasonable because it preserves the older theory, and not the better theory. Hypotheses contradicting well-confirmed theories give us evidence that cannot be obtained in any other way. Proliferation of theories is beneficial for science, while uniformity impairs its critical power. Uniformity also endangers the free development of the individual.

# Against Method

- There is no idea, however ancient and absurd, that is not capable of improving our knowledge. The whole history of thought is absorbed into science and is used for improving every single theory. Nor is political interference rejected. It may be needed to overcome the chauvinism of science that resists alternatives to the status quo.
- No theory ever agrees with all the facts in its domain, yet it is not always the theory that is to blame. Facts are constituted by older ideologies, and a clash between facts and theories may be proof of progress. It is also a first step in our attempt to find the principles implicit in familiar observational notions.



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- Irrational methods of support are needed. Modern science survived only because reason was frequently overruled in the past.

# Against Method

- Neither science nor rationality are universal measures of excellence. They are particular traditions, unaware of their historical grounding.
- Science is neither a single tradition, nor the best tradition there is, except for people who have become accustomed to its presence, its benefits and its disadvantages.



# Law and Science



# Law is not a science

- A branch of practical reason.
- An art (argumentation/social governance by rules of conduct).
- A normative phenomenon.
- A social ordering instrument.
- A body of applied learning.
- A product of custom, legislation, and judicial development.

# Law is not a science

- Law has remained Aristotelian, while science has built up a new world of analyzed, systematized, and recorded facts.
- It is not being susceptible of being falsified because its nature is prescriptive.
- Pre-paradigmatic.
- Law does not follow the scientific method.
- Law does not discover new elements or principles, or put new instruments or knowledge at the service of humanity.

# Law as a science

- A well-defined community of legal scholars (faculty members, researchers, authors) who see law as scientific.
- Law and legal scholars played a pivotal role in the creation and expansion of modern science.
  - Francis Bacon law, like astronomy or chemistry, was a science, and thus was susceptible to the application of reason and the new scientific method.
  - By the end of the seventeenth century both science and law (especially under the influence of Roman law) were moving to new more systematic, syllogistic paradigms, based upon the belief that by reason and principled argument, legal truth could best be discovered.
- Thousands of associations devoted to the research of law around the world.

# Law as a science

- Conferences and congresses.
- Peer-reviewed publications.
- Higher education teaching.
- Recognition of other scientific disciplines
- Demarcation of boundaries with other disciplines in the production of scientific knowledge.

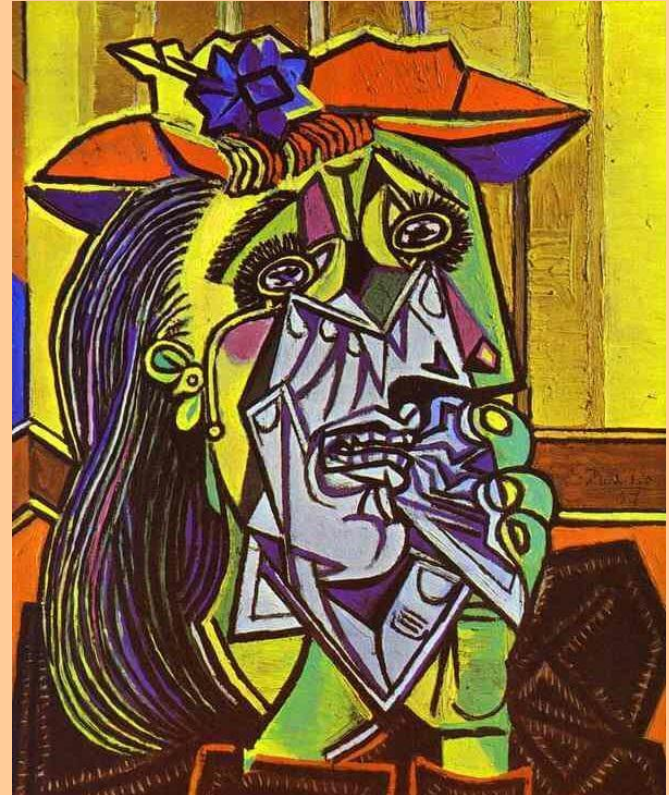


# Epistemological contexts



# Epistemological contexts

- Context of discovery.
- Context of justification.
- Context of application.

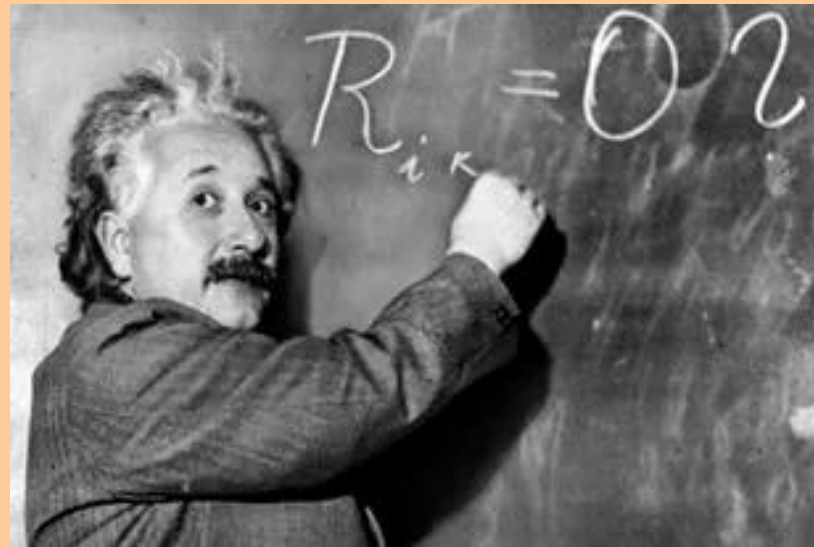
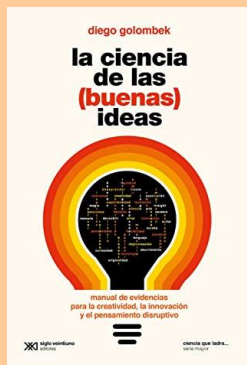


# Context of discovery

- It refers to the way in which a new theory is generated, i.e., the way in which scientists propose new ideas, concepts, hypotheses and principles.
- It has to do with the way in which the ideas that lead to the development of a theory occur to its creator. The generation of a new theory does not have a logic or a particular method, nor does it follow any standard pattern. What allows the creation of a science in a certain case does not work in others.
- Every discovery has an irrational element or a creative intuition and calls for breaking a large number of routine schemes of the epistemological and methodological tradition and, especially, the representation of research development as a succession of different, predetermined stages.

# Context of discovery

- Creators are generally experts, who are obsessed with their work.
- Obsession generally comes from a question, from an ‘I don’t know’.
- Frequent pattern: work, work, pause: creation.



# Context of discovery

- Inspiration is not the exclusive privilege of poets or artists generally. There is, has been, and will always be a certain group of people whom inspiration visits. It's made up of all those who've consciously chosen their calling and do their job with love and imagination. It may include doctors, teachers, gardeners – and I could list a hundred more professions. Their work becomes one continuous adventure as long as they manage to keep discovering new challenges in it. Difficulties and setbacks never quell their curiosity. **A swarm of new questions emerges from every problem they solve. Whatever inspiration is, it's born from a continuous “I don't know.”** (Wisława Szymborska, Nobel Lecture, December 7, 1996)



# Context of discovery

- There aren't many such people. Most of the earth's inhabitants work to get by. They work because they have to. They didn't pick this or that kind of job out of passion; the circumstances of their lives did the choosing for them. Loveless work, boring work, work valued only because others haven't got even that much, however loveless and boring – this is one of the harshest human miseries. And there's no sign that coming centuries will produce any changes for the better as far as this goes.
- All sorts of torturers, dictators, fanatics, and demagogues struggling for power by way of a few loudly shouted slogans also enjoy their jobs, and they too perform their duties with inventive fervor. Well, yes, but they “know.” They know, and whatever they know is enough for them once and for all. They don't want to find out about anything else, since that might diminish their arguments' force. And any knowledge that doesn't lead to new questions quickly dies out: it fails to maintain the temperature required for sustaining life. In the most extreme cases, cases well known from ancient and modern history, it even poses a lethal threat to society.

# Context of justification

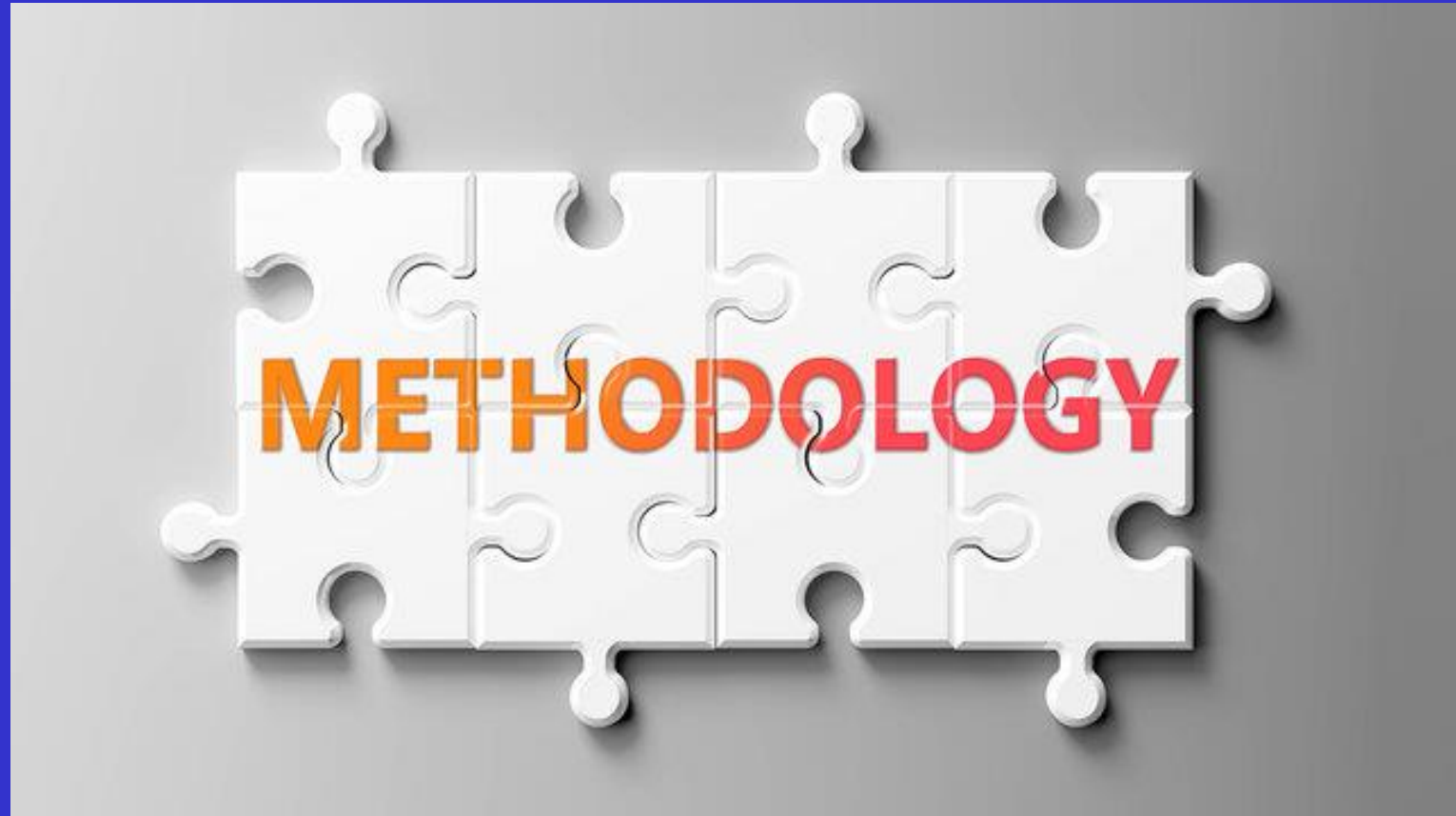
- It implies the validation of the theory, i.e., the determination of the epistemological validity of the knowledge produced.
- This context answers questions such as: “Can a claim be justified? And if so, how? Is it verifiable? Does it logically depend on some other claims? Or does it contradict them?”
- Beyond these general questions and given that there are no external criteria and validation objectives applicable to all sciences, discipline adopts its own method of justification.

# Context of application

- The application of the theory.
- In law, this context is highly connected to legal practice, in particular, with the settlement of disputes in court.



# Methodological dimension

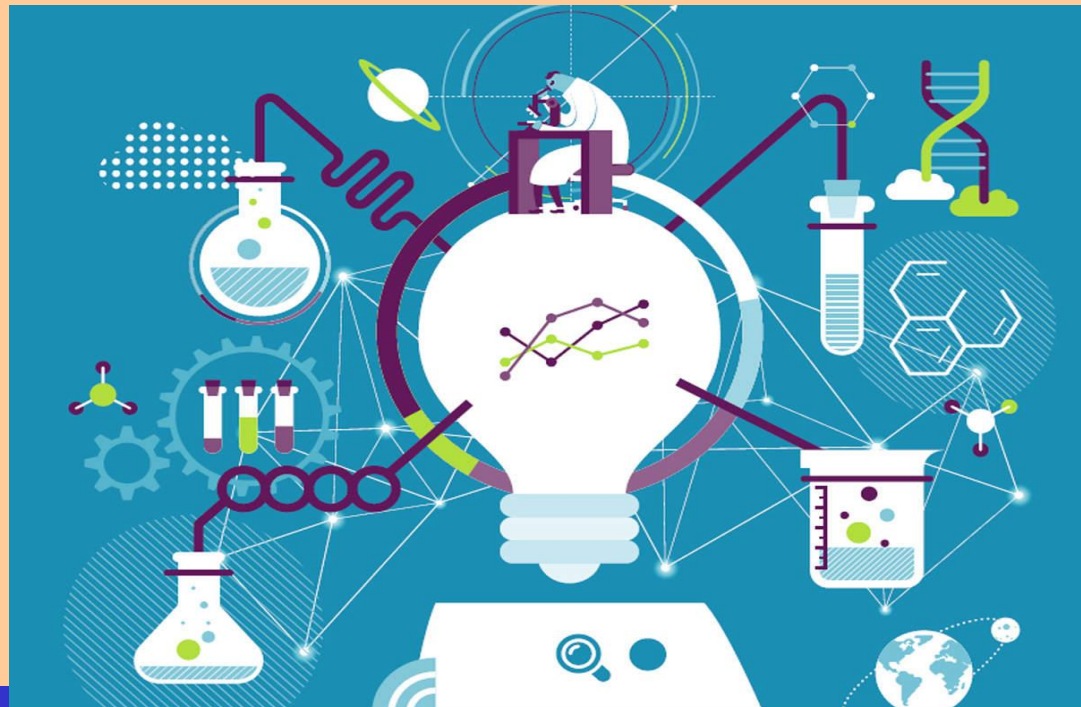






# Research

Research is conceived of as a way of looking for a solution to a problem through a systematic process, which includes the production of valid and reliable information and requires the completion of certain stages so as to ensure that the solution to the problem is also valid.



# The research problem



# Research problem

- A research problem is a state of things, events, situations, or processes, whether theoretical or empirical, which are perceived as unsatisfactory or problematic.
- The problem reflects a contradiction with prior knowledge, that is, it is known against prior knowledge and the resolution of the problem implies challenges to prior knowledge of science, which become epistemological obstacles that must be challenged and overcome (Bachelard).
- Problems are only problematic in light of some theory.
- If the solution to the problem is not obvious within the set of existing knowledge and techniques, the problem requires research.
- Since problems do not exist in isolation, the selection and formulation of the problem presuppose some general experience and knowledge of the subject.
- Science starts with problems, not with observation.

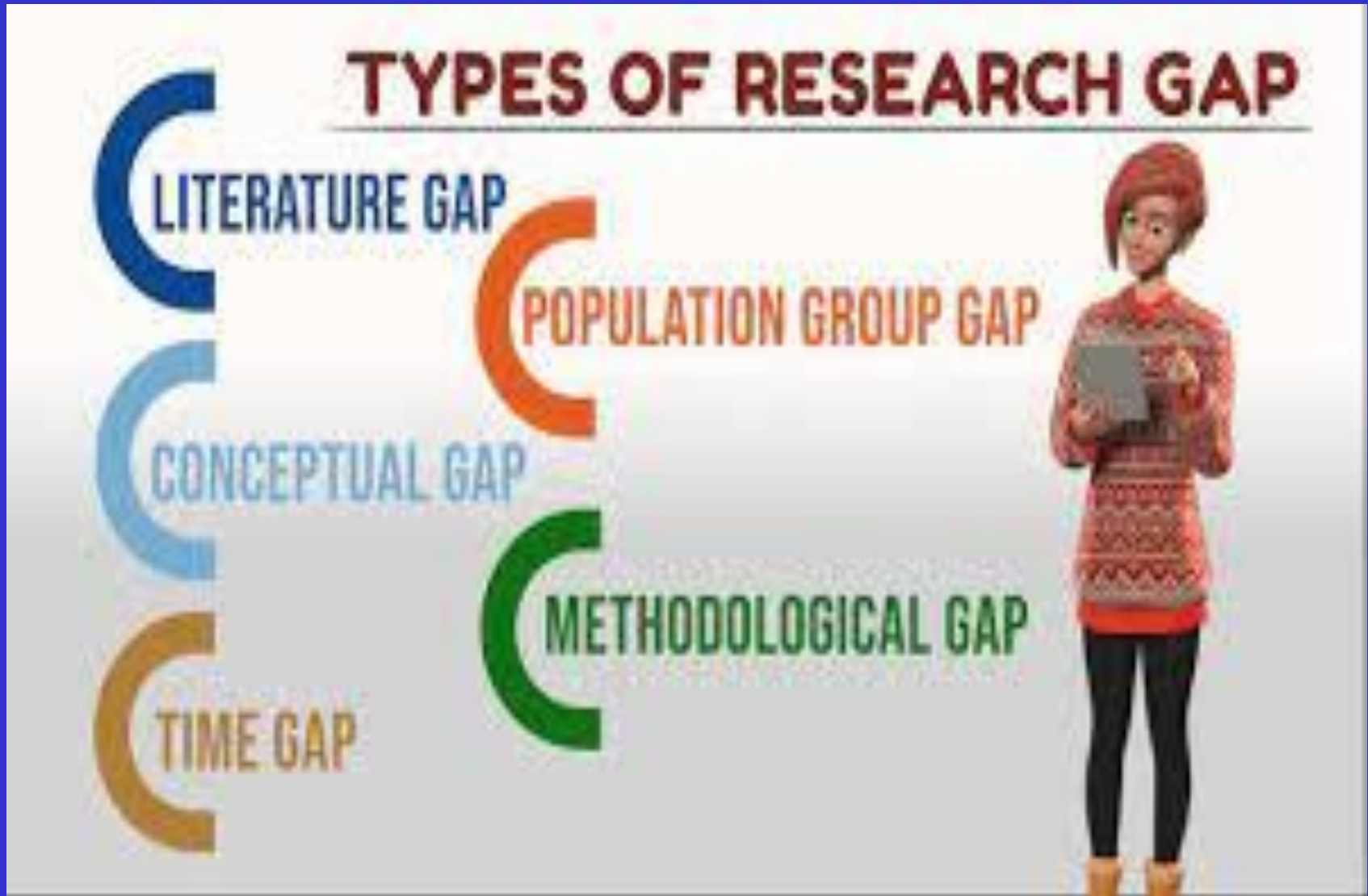


# Research problem: A gap in the literature

- To formulate a problem, it is necessary to review the literature in the discipline, i.e., the theoretical and empirical knowledge produced on the subject in question.
- The research problem must be preceded by a study of the literature and a mapping of what has already been discovered. The research problem must converse with the literature and must find a **gap in the literature**, which the research must fill.
- A gap in the literature is insufficient information or a missing piece in the research literature. A gap identifies an area that is unexplored, under-explored, or outdated.
- The identification of the gap is not enough. The problem must still be worthy of exploration and must have valuable practical and/or theoretical implications.



# Research problem: A gap in the literature



# Research question

- The research question is the main question that a research project aims to answer and constitutes the core aspect of an investigation.
- A research question defines and guides the conceptual field of the investigation and reflects the direction and epistemological foundations of the research process, which conditions the strategies to be selected.
- The question is the origin of all knowledge, without which there can be no scientific knowledge (Bachelard).

# Research question

- In qualitative research, the research question seeks to explore or describe phenomena, without providing an orderly nomothetic explanation as in quantitative research, thus trying to understand the experiences, understandings, and meanings that people have about the concepts present in the question. research.



# Research problem vs research question

- Problem formulation may include a question, but not every question is a problem.
- But the research problem must still be clearly formulated as a statement, which may include a question at the end.



# Research problem: Examples

The WHO and reputed epidemiologists recommended social distancing, the use of face masks, quarantines, and even complete lockdowns to deal with Covid-19.

Some countries that adopted these measures from the beginning of the Covid-19 pandemic had low infection and death rates.

However, other countries which implemented these same measures, had higher infection rates –even considerably higher than countries which had adopted none of the suggested measures.

How can the difference in infection and death rates be explained in countries that adopted the same WHO-recommended measures?

# Examples of poor research problems.

- There is no hospital in Wawa, so its residents must travel more than 300 km to access a hospital.
- Is it possible to wear a face mask when playing soccer, basketball, and other team sports.
- According to a recent poll, most citizens do not approve of the current federal government.



# How to find research problems

- Many publications based on research projects include recommendations for future research.
- You identify contradictions, anomalies in a theory.
- A theory lacks elaboration.
- A certain author generated some interesting results, but never followed up on those results.
- You can review a successful theory, but disagree with the results, the tests used, or the methodology and retest the hypothesis.
- A theory was tested in a certain historical or geographical context; and you may want to adapt it to another historical period or to another society.

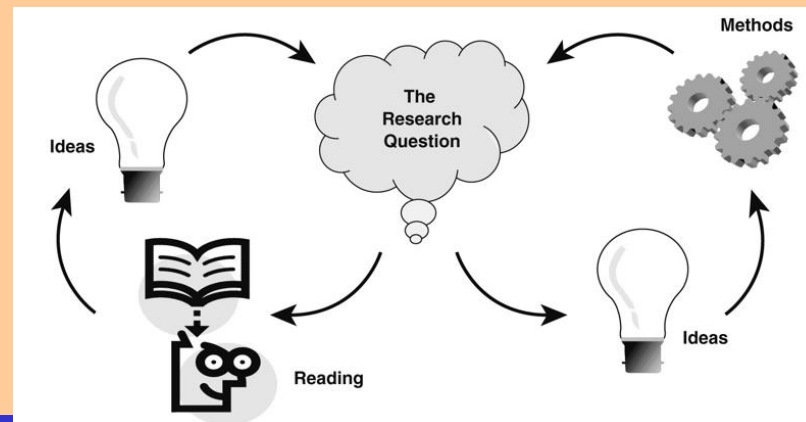


FIGURE 3.4 CYCLES OF RESEARCH QUESTION DEVELOPMENT

# The structure of a research problem: Laudan

## Empirical vs. conceptual problems.

- Empirical problems are first-order about the substantive entities in some domain.
- A conceptual problem is a problem exhibited by some theory. It is a higher order question about a well-foundedness of the conceptual structures, i.e., theories, which have been devised to answer first order questions.
  - **Internal conceptual problems.** When a theory exhibits certain internal inconsistencies, or when its basic categories of analysis are vague and unclear.
  - **External conceptual problems.** When a theory is in conflict with another theory or doctrine, which the former's proponents believe to be rationally well founded.

# Internal conceptual problems. Laudan

- A logically inconsistent theory, and thus self-contradictory.
- Conceptual ambiguity or circularity within the theory.
  - Some degree of ambiguity is ineliminable.
  - Some small measure of ambiguity is positive, since less rigorously defined theories can often be more readily applied to new domains of investigation than rigid ones.
  - Systematic and chronic ambiguity or circularity within a theory is highly disadvantageous.
  - **The explication of conceptions.** The increase of the conceptual clarity of a theory through careful clarifications and specifications of meaning is one of the most important ways in which science progresses (William Whewell, 1840).

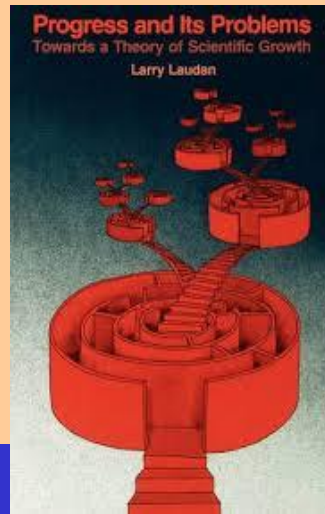
TRUTH, ERROR,  
AND  
CRIMINAL LAW

An Essay in  
Legal Epistemology

LARRY LAUDAN

# External conceptual problems. Laudan

- **Inconsistency.** A logical inconsistency or incompatibility with another theory.
- **Implausibility.** When there are two theories, even when compatible, and the acceptance of one of them makes less plausible that the other is acceptable.
- **Compatibility.** When a theory emerges which ought to enforce another theory, but fails to do so and is merely compatible with it.
  - Interdisciplinary structure of science. At any given epoch, there are hierarchical systems of interconnection among the various sciences which condition the rational expectations which scientists have when they appraise theories.



# External conceptual problems. Laudan

## Classes of difficulties which can generate external conceptual problems

- **Intra-scientific difficulties.** Two scientific theories from different domains are in tension.
- **Methodology.** A scientific theory is in conflict with the methodological theories of the relevant scientific community.
- **Worldview.** A scientific theory is in conflict with any component of the prevalent worldview.



# The structure of a research problem



1. Internal inconsistency of the research object.
2. Contradiction between two research objects.
3. Lack of elaboration of a research object.
4. Adequacy of a research object to higher-level research object.
5. The effects or consequences of the research object.
6. Erroneous application of a research object.
7. Comparison and contrast between two research objects.
8. The cause or origin of a research object.
9. The development or evolution of a research object.
10. The lack of sufficient information in the literature about the research object.
11. The advantages and disadvantages of the research object.

# Elements of a research problem

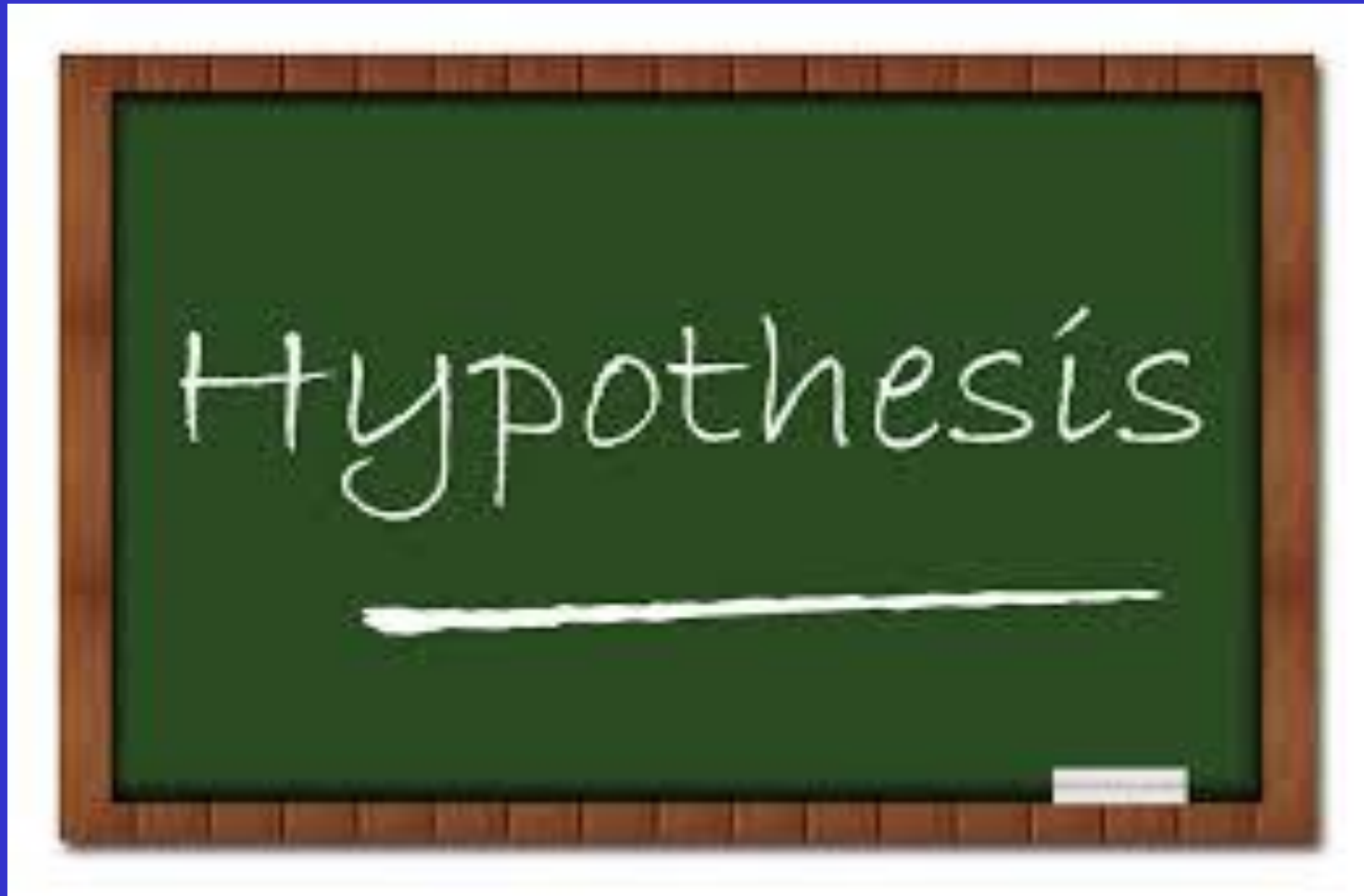
- The premise
  - Implicit or explicit.
  - The premise must be valid.
- The topic
  - The what of the research problem.
  - It is the research object, e.g., a theory, a social phenomenon, a norm such as a law or a legal principle.
- The temporal dimension of the problem.
  - When.
- The spatial dimension of the problem.
  - Where.
- The population or universe of the problem.
  - Who.



# Strategies

- The research problem makes it clear why it is a problem and why it is important to solve it. For example, it is not enough to say that the effects of quarantine on older adults will be investigated. It is necessary to explain why this is a problem and why it deserves to be investigated.
- It is possible to obtain the necessary evidence to address the problem. For example, if you want to know the origin of a word in the Russian language and you don't speak Russian, it will be impossible to carry out this research.
- The research problem is precise and clear. It does not use ambiguous terms that require definitions.
- It is formulated according to one of the valid structures of research problems.
- The premises of the research problem are explicit and valid.
- The research problem contains all the required elements.

# Hypothesis



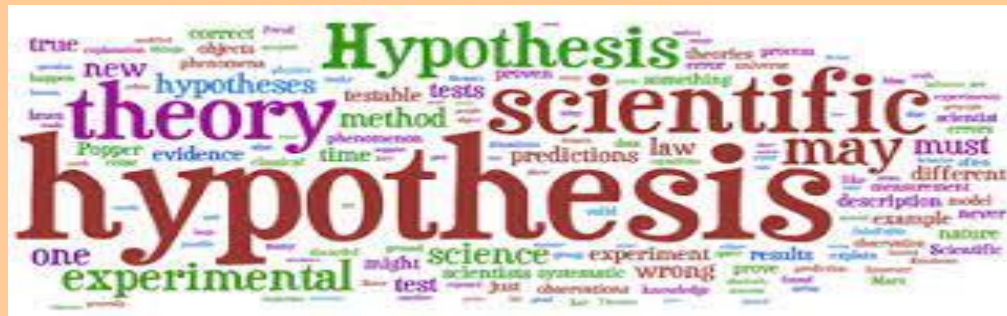
# Hypothesis

- The hypothesis is a provisional or conjectural solution to the problem formulated as a declarative statement.
- It includes, at least, two variables and, at least in a general sense, it had to be testable or verifiable.
- The hypothesis must be based on the literature review and must be scientifically based, i.e., it must be compatible with the existing body of knowledge.
- If the research problem included a research question, then the hypothesis is the answer to that question.



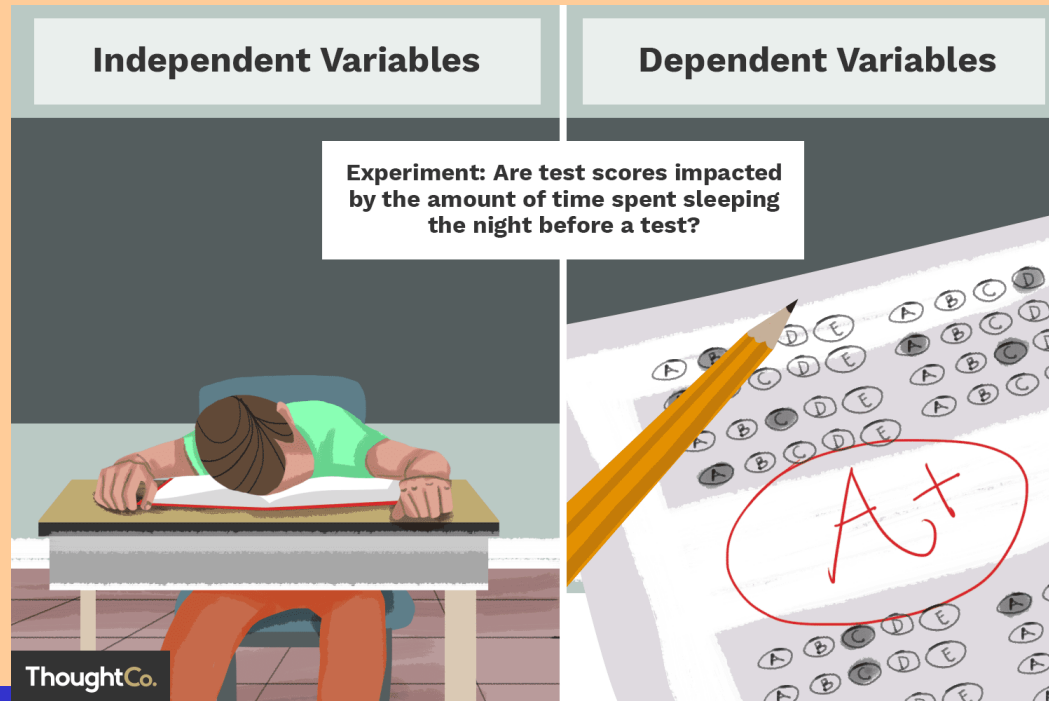
# Hypothesis. Example

The population in countries that adopted WHO-recommended measures for dealing with Covid-19 and had higher infection and death rates than other countries that also adopted these measures, did not follow –or followed quite loosely- these WHO-recommended measures.



# Hypothesis

- The variables in a study of a cause-and-effect relationship are called the **independent and dependent variables**.
- The **independent variable** is the **cause**. Its value is *independent* of other variables in the study.
- The **dependent variable** is the **effect**. Its value *depends* on changes in the independent variable.



# Research objectives



# Research objective

- The research objectives are the specific achievements that the researcher expect to obtain in their research project.
- It summarizes what will be accomplished with the research.
- Research objectives are usually divided into general and specific objectives.
- The general objective is the global statement about the final result to be achieved
- The specific objectives are the steps that must be taken to achieve that general objective.



# Research objective. Example

- To analyze the cause for the disparity of infection and death rates between the countries that adopted the same measures to combat Covid-19 pandemic.



# Research objective. Strategies

- General research objective has to be clear, concise, and declarative. It provides guidance for carrying out the project.
- A clearly defined research objective helps the researcher focus on the study and determine the type of knowledge that will be produced.
- The general objective should not be too broad.
- Before formulating the research objective, it is necessary to do the literature review.
- The formulation of the objectives allows the researcher to limit their study to its essentials.

# Research problem, objective, and hypothesis: Example

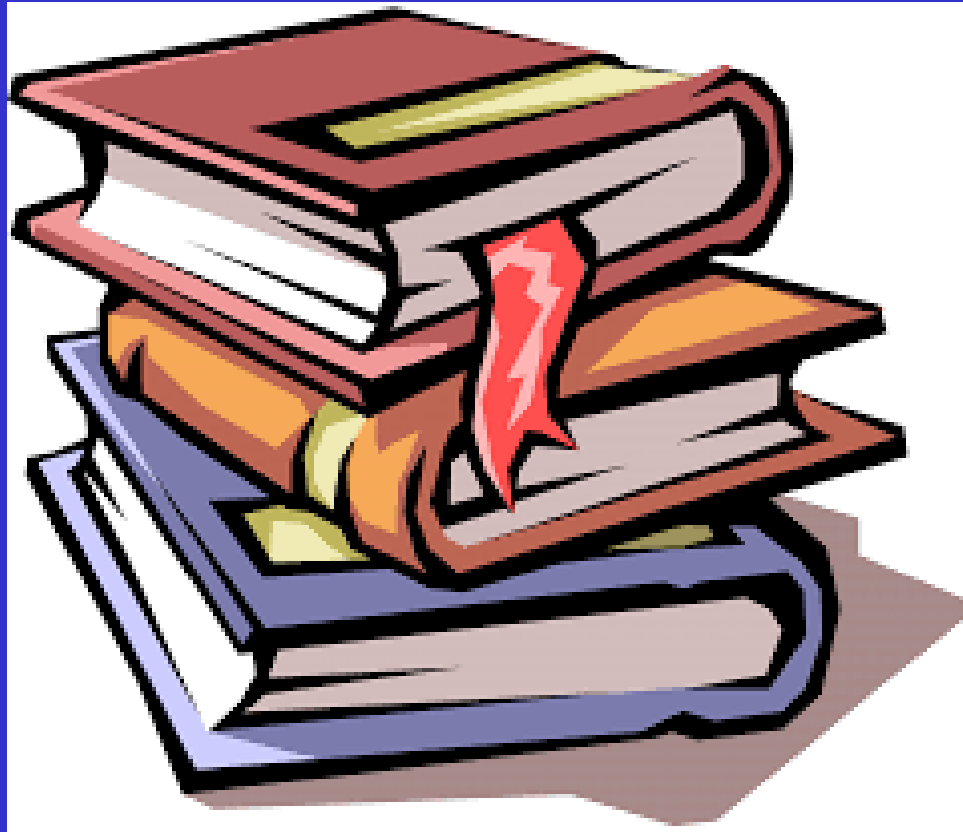
**Research problem:** Canada, like many other states, has been adopting measures to combat the coronavirus pandemic both at the federal and provincial levels. These measures restrict the rights and freedoms of Canadian citizens, such as the obligation to stay isolated for 14 days after returning to Canada, social gathering prohibitions, and business and school closures, among others. Although for both the official and opposition political leaders, argue that these measures are necessary and legitimate, voices have been raised against their constitutionality.

**Research question:** Are the measures adopted by Canada to combat the Covid-19 pandemic constitutional?

**Objective:** To examine the constitutionality of the federal and provincial measures adopted by the Canadian governments to combat the coronavirus pandemic.

**Hypothesis:** The federal and provincial measures adopted by the Canadian governments to combat the coronavirus pandemic are unconstitutional because they do not meet the Oakes test.

# Theoretical framework



# Theoretical framework

- The theoretical framework is a coherent system of concepts, theories, postulates, definitions, categories, and propositions that constitutes the structure that supports the theory of the research project and establishes the perspective from which the problem is examined.
- It is the theory or the line of research with which the researcher works.
- The theoretical framework is the structure that supports the theory of the research project; and it establishes the perspective by which the problem is examined.

# Theoretical framework

- Ultimately, the findings have to be analyzed in terms of how they relate to the theory or line of research underpinning the study.
- The selected theory has to inform the formulation of the problem, the justification for the study, the questions and hypotheses, the selection of instruments, and the choice of methods.



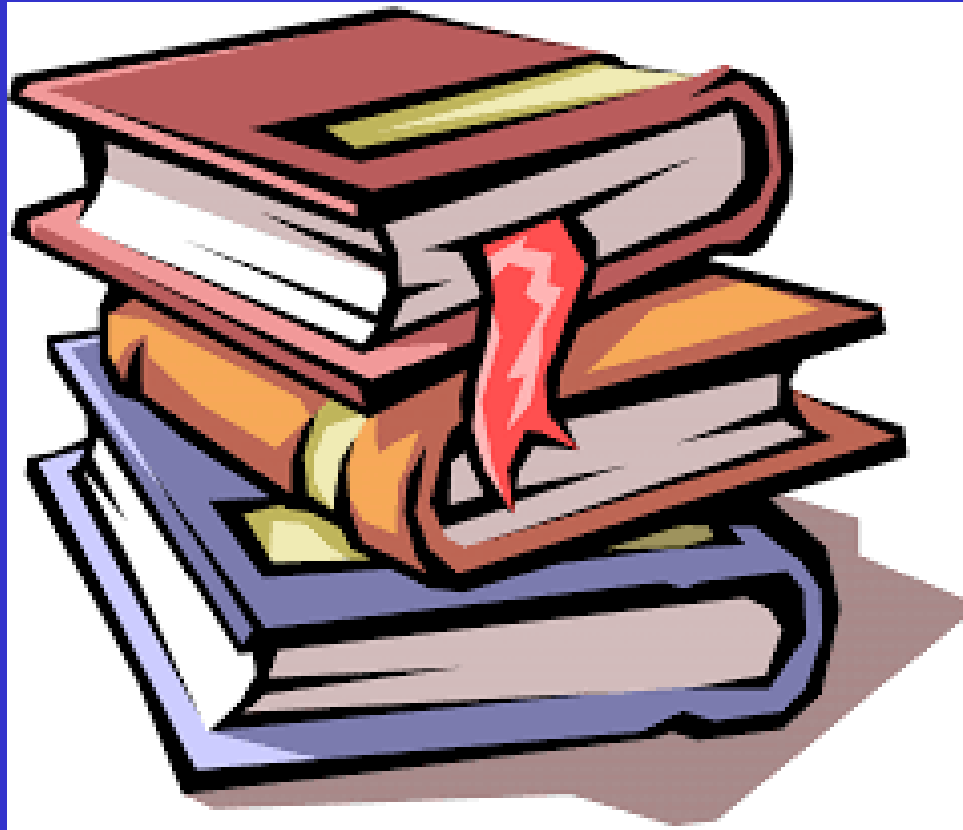
# How to elaborate the theoretical framework

- The theoretical framework is determined by the characteristics and needs of the research.
- To develop the theoretical framework, the literature should be reviewed (consultation of bibliography and other sources).
- A theory must be adopted or a theoretical perspective developed to explain what, how, when, and why the research object occurs.
- The theoretical framework is a detailed description of each of the elements of the theory that will be directly used in the development of the research.

# Example of a theoretical framework

- Research object: The rights of Canadian citizens stranded in foreign countries due to Covid-19 travel restrictions.
- The problem will be analyzed in light of Critical Legal Studies perspective, which assumes that the Law constitutes an instrument used as a symbol for the legitimation of power or domination. This theoretical approach will allow us to analyze the ideological nature of the regulations on travel restrictions during the Covid-19 pandemic.

# Literature review



# Literature review

- The literature review is a statement about what the literature has said about the research problem and operates as a starting point for the researcher's own contribution, by situating the research project in what is known about it. The literature review makes the authors converse about the research problem.
- The purpose of the literature review is to place research in the context of what is already known about a topic.
- The literature review is conceived of a systematic and critical exposition of the theoretical and empirical knowledge produced on a certain subject.

# Literature review

- It helps formulate the problem, produce the hypothesis; and it also helps contextualize the discussion of the findings.
- It is the result of a rigorous bibliographical research
- At the undergraduate level, the literature review need not be exhaustive, but it needs to be relevant.
- At the doctoral level, the literature review must be exhaustive. It has to cover also literature that is not part of the theoretical level.

# Literature review

- The literature review may not be general. It must be closely related to the research objective.
- The literature review is not a mere list of quotes from authors, but rather it is the analysis of previous research on the research problem.
- The literature review implies evaluating and synthesizing different sources to obtain a broad overview of the field within which the research will be situated.
- It is necessary to identify and group common and emerging approaches, patterns, trends, areas of conflict, controversies, and gaps within the relevant literature.
- When doing the literature review, it is necessary to compare, contrast, synthesize, and argue what is proposed by each author.
- The works discussed in the literature review, generally speaking, should be used in the development of the research project.

# Example of a poor literature review

Sabatelli, Buck and Dyer (1982) understand that having good non-verbal communication skills can be considered beneficial in criminal trials.

Weisfeld and Stack (2002) point out that non-verbal communication can consist of looking, smiling, frowning, touching, or expressions of surprise and that a defendant charged with a property offence looks at the judges more than a defendant accused of a violent crime.

Sullivan and Connor (2015) argue that having good non-verbal communication skills can be considered beneficial in criminal trials.



# Example of a good literature review

For many, non-verbal communication can take a back seat to verbal communication. It is often overlooked and can be considered unimportant. However, this aspect of communication speaks volumes. Nonverbal communication can consist of looking, smiling, frowning, touching, or making surprised gestures as observed in the research study by Weisfeld and Stack (2002). It has been found that during criminal trials, those accused of property crimes display these forms of communication more frequently than those accused of violent crimes (Weisfeld and Stack, 2002 ). Sullivan and Connor (2015) studied non-verbal behaviors in criminal trials and found that defendants accused of property crimes look at judges in the eye for a significantly longer period of time than those charged with violent crimes. In their study focused on non-verbal communication and its relationship to criminal trials, they found that those accused of violent crimes tend to receive sentences closer to the maximum limit than those accused of property crimes. Their hypothesis is that having good non-verbal communication skills can be considered an advantage in criminal trials.

# Methodology



# Methodology

- The methodology is a procedure that allows the production of systematic and rigorous solutions to the research problem.
- The methodology has to make explicit how data are collected and analyzed.
- In quantitative projects, the researcher has to measure data.
- In qualitative projects, the researcher has to construct data; and in hermeneutics projects, they have to gather the texts they will use for their interpretation.
- The researcher has to choose the data collection tools most appropriate for their project and construct their own instruments. In qualitative projects, these can include interviews, focus groups, observations, and document analysis.

# Methodology

- For the data analysis, researchers have to explain in detail how they worked with the data that they collected in order to obtain the information they used to provide a solution to the research problem and to answer the research question.
- For qualitative projects, data analysis varies according to the adopted data collection tool. It can include: identifying common themes, establishing relationships between elements, placing elements together in a certain form, separating material elements into constituent elements, studying the elements or essential features of a concept, and discerning elements into meaning units, among many other processes.
- For purely hermeneutics projects, data analysis is replaced with interpretation of texts following the hermeneutics circle. This implies a dialectical process in which the researcher navigates between the parts and the whole of the text to achieve an adequate understanding of the text. This approach also involves a translation process, as a new text is produced, which, while respecting the essence of the original text, provides an added value to the text under interpretation by emphasizing on its historical context.

# Quantitative vs. qualitative research

**QUANTITATIVE  
RESEARCH**



**VS**

**QUALITATIVE  
RESEARCH**



# Quantitative research



## QUANTITATIVE RESEARCH



# Quantitative research

- Quantitative research is associated with the scientific model, which is based on the premise that there is an objective world from which the scientist can extract data and verify it through empirical research, that is, a process of observations about the world that involves making conjectures (hypotheses), derive predictions from them as logical consequences, and then perform empirical observations or experiments based on those predictions.

# Quantitative research methods

- The experiments carried out in quantitative research projects produce quantitative data, since they aim to measure the research object.
- Quantitative research collects these data in numerical form, which can be classified into different categories, or in order of hierarchy, or in units of measurement.



# Quantitative research: data analysis

- Statistics make it possible to convert quantitative data into useful information for decision making.
- Statistics allow data to be summarized, describing patterns, relationships, and connections.
- Statistics can be descriptive or inferential.
- Descriptive statistics allow the data obtained to be summarized, while inferential statistics are used to identify statistically significant differences between data groups (such as the intervention and control groups in a randomized control study).

# Characteristics of quantitative research

- Quantitative research aims to control variables by conducting controlled studies in laboratories.
- The research aims at objectivity, i.e., to produce results without bias.
- The research design is determined before research begins.
- For the quantitative researcher, reality is objective and exists separate from the researcher. Reality can be examined and verified by anyone.
- The research object is external to the researcher.
- Research is used to test a theory and ultimately to support or reject it.

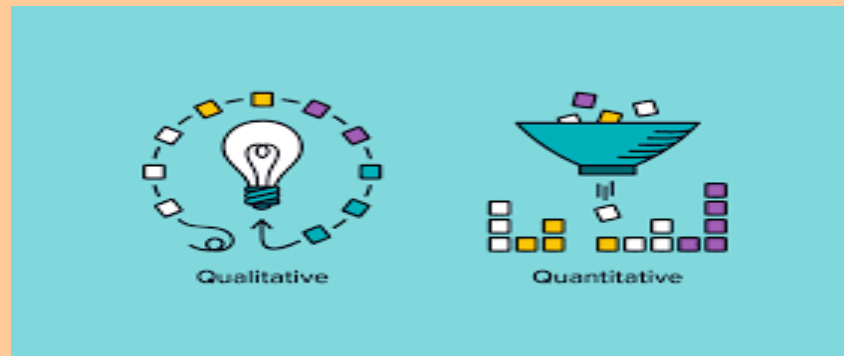


# Qualitative research



# Qualitative research

- The objective of qualitative research is to understand the social reality of individuals, groups and cultures as closely as possible to what its participants feel or experience it.
- Qualitative research implies an interpretive and naturalistic approach to the world. This means that qualitative researchers study objects in their natural settings, trying to make sense of, or interpret, phenomena in terms of the meanings that people attribute to them.



# Qualitative research methods

Qualitative research has not adopted a single method of data collection and analysis, but rather it takes methods, techniques, and instruments from various disciplines and research practices.



# Characteristics of qualitative research

- Phenomena and events can be properly understood only when viewed in context. Therefore, a qualitative researcher immerses himself/herself in the field, in a natural environment. Inquiry contexts are not contrived; they are natural. Nothing is predefined or taken for granted.
- Qualitative researchers want their research subjects to speak for themselves, to provide their perspectives in words and actions. Therefore, qualitative research is an interactive process in which the research subjects teach the researcher about their lives.
- The qualitative researcher is an integral part of the data, without the active participation of the researcher, there is no data.
- The research design evolves during the research and can be adjusted or changed as research progresses.
- For the qualitative researcher, there is no single reality. Reality is subjective and exists only in reference to the observer.
- Theory is based on data and emerges and evolves during the research process.

# Qualitative research methods

## Types of Qualitative Research Methods



**One-on-one interview**



**Focus groups**



**Ethnographic research**



**Case study research**



**Record keeping**



**Qualitative observation**

# Qualitative research methods

- Interviews.
- Surveys.
- Focus groups.
- Observation and ethnographies.
- Action research.
- Life histories.
- Introspection.
- Case studies.
- Artifacts, texts, and cultural productions.



# Qualitative methods: Interviews

Interviews collect in-depth content in a one-on-one setting.

- **Structured.**
  - Verbally administered questionnaires, in which a list of predetermined questions are asked, with little or no variation and with no scope for follow-up questions.
- **Semi-structured.**
  - Several key questions that help to define the areas to be explored, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail.
- **Unstructured.**
  - Open questions and follow ups.

# Qualitative methods: Surveys

- It is the process of conducting research using surveys that researchers send to survey respondents. The data collected from surveys is then analyzed to draw meaningful research conclusions.
- They involve the use of standardized questionnaires or interviews to collect data about people and their preferences, thoughts, and behaviors in a systematic manner.
- The survey method can be used for descriptive, exploratory, or explanatory research.



# Qualitative methods: Focus groups

- The researcher engages a small group of participants in a conversation designed to generate data relevant to the research question.
- The main aim of the focus group is to find answers to the “why” “what” and “how” questions.
- They can contain anywhere from 5 to 15 participants.



# Qualitative methods: Observation and ethnographies, and action research

- **Observation.** A researcher studies people as they go about their daily lives without participating or interfering.
- **Ethnographic research.** It is the most in-depth observational method that studies people in their own environment. This method requires the researchers to adapt to the target audiences' environments. This research design aims to understand the cultures, challenges, motivations, and settings that occur. Instead of relying on interviews and discussions, the researcher experiences the natural settings first hand.
- **Action research.** It is a reflective process of progressive problem solving led by individuals working with others in teams or as part of a "community of practice" to improve the way their practice and how to address issues and solve problems.

# Qualitative methods: Life history

- It is a dynamic process between researcher and participant that endeavors to provide a full-scale autobiographical account” by allowing interviewees to relate their entire life, from childhood to the present.
- The researcher and the participant construct a narrative in a collaborative fashion, utilizing multiple data sources such as one-on-one interviews and observations. A variety of artifacts, whether they are in hard copy (e.g., a diary) or digitized (e.g., an e-mail message), may also play a role in data collection and analysis.
- In its finished state, a life history document is a contextually bound representation of the life of the participant.
- Frequently, the questions and findings highlighted by a life history have illuminated broader cultural and societal concerns that might have otherwise escaped scholarly attention.

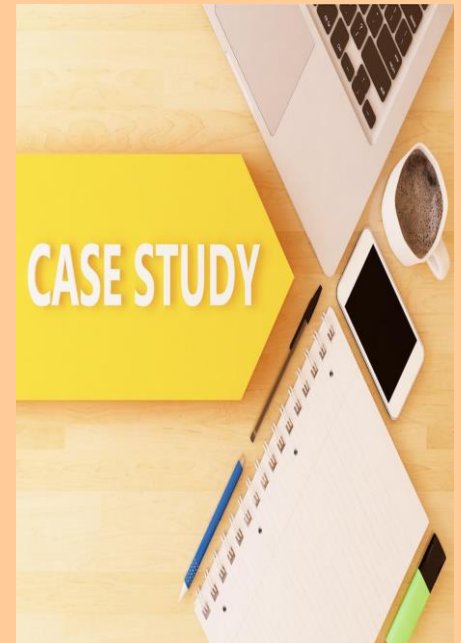
# Qualitative methods: Introspection

- It is an ongoing process of tracking, experiencing, and reflecting on one's own thoughts, mental images, feelings, sensations, and behaviours.
- It involves investigating one's own subjective experiences, examining one's lived experiences for insights or knowledge generation.



# Qualitative methods: Case study

- A case study is a detailed study of a specific subject, such as a person, group, place, event, organization, or phenomenon.
- It enables researchers to conduct an in-depth exploration of intricate phenomena within some specific context.

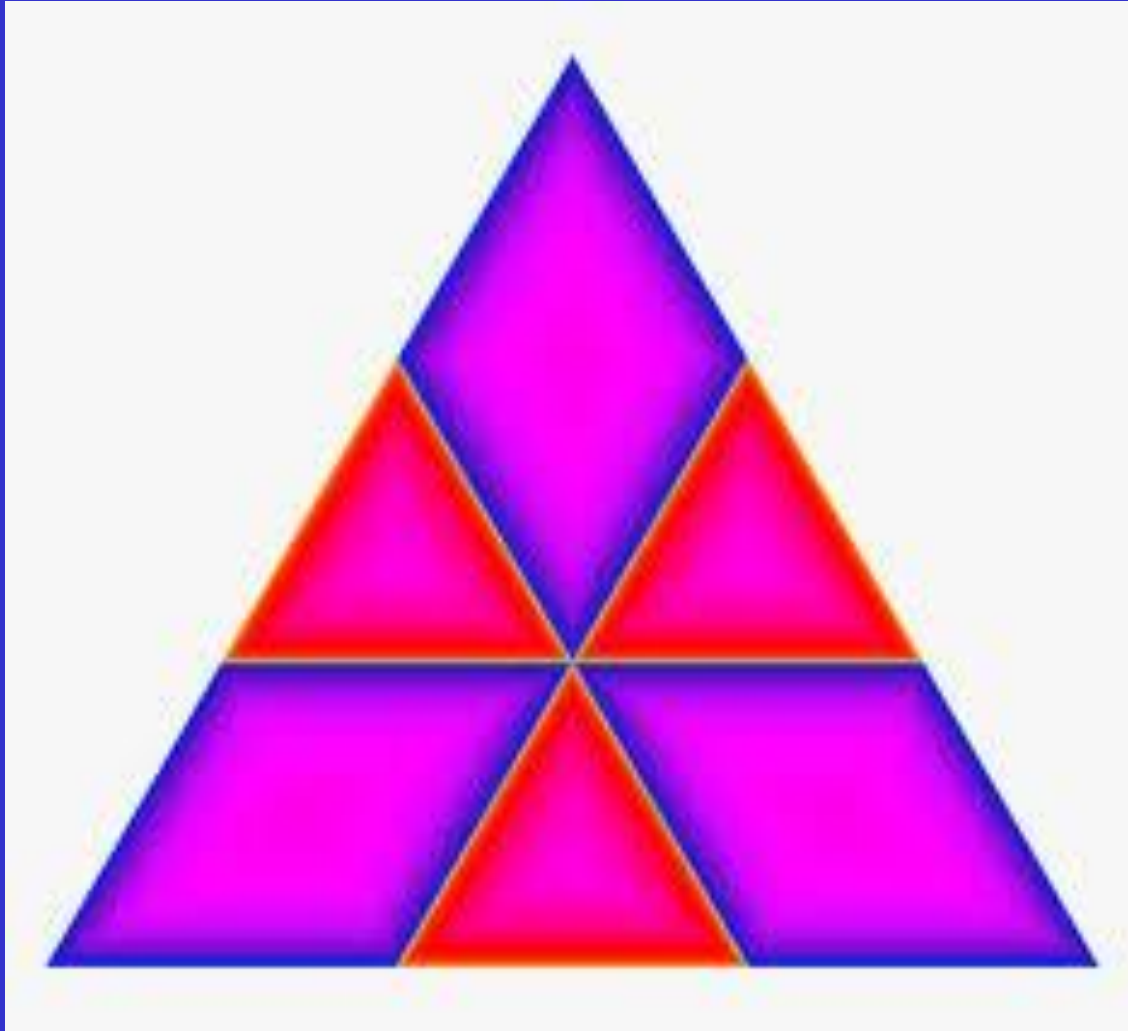


# Qualitative methods: Artifacts, texts, and cultural productions.

- It is an unobtrusive methods for collecting information about human behaviors.
- It involves an intense microanalysis of documents and artifacts to answer an almost unlimited number of research questions.
- Examples of artifacts include books, media materials; letters, e-mail records, furniture, objects, etc.



# Triangulation



# Triangulation

- Triangulation as a qualitative research strategy is used to test validity through multiple methods or data sources in order to develop a comprehensive understanding of phenomena.
- In Grounded theory, triangulation does not seek to corroborate the results obtained through the constant comparative method, as this would imply a vision of the social world where there is a single, objective, and knowable social reality, which would reduce the researcher's task to measuring and validating the social phenomenon.
- Social phenomena are multidimensional and through triangulation it is possible to capture the different dimensions of the phenomenon in question.

# Triangulation

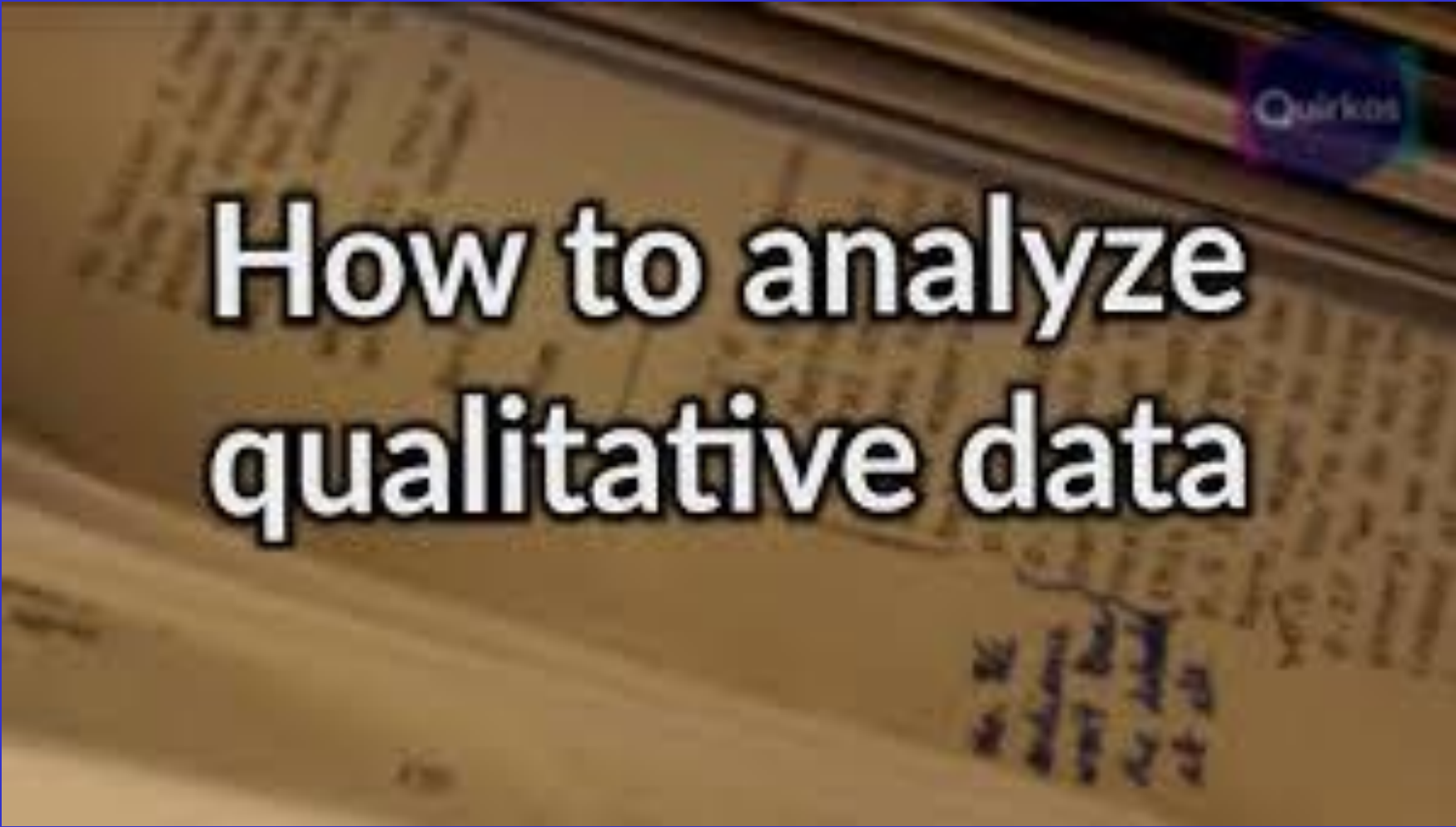
## TYPES OF TRIANGULATION

1. Data Triangulation
2. Investigator Triangulation
3. Theoretical Triangulation
4. Methodological Triangulation
5. Environmental Triangulation

October 15, 2014

TRIANGULATION IN QUALITATIVE RESEARCH  
DANNY GLASSMANN, PH.D.

# Data analysis in qualitative research



**How to analyze  
qualitative data**

# Qualitative research data analysis

- Qualitative research is infinitely creative and interpretive.
- Qualitative interpretations are constructed and various techniques can be used to make sense of the data, such as content analysis, grounded theory, thematic analysis, or discourse analysis.
- The qualitative perspective seeks to understand the meanings, characteristics, and symbols of the research object, trying to see the whys and hows. I
- Instead of quantifying, the qualitative perspective wants to understand the research object and explore it without always resorting to previous categories of analysis.
- Unlike quantitative research, qualitative research attempts to discover the object while research is being conducted.

# Qualitative research data analysis

- The research object is not something external to the researcher, but rather the object is a construction that arises from the interaction between the researcher and what the researcher determines and defines as an object.
- The more the researcher is aware of their own subjectivity and how it influences the research object, the further the research moves away from the quantitative perspective of the scientific model.
- At the far end of the quantitative perspective, the researcher not only makes their subjectivity explicit, i.e., their social class, gender, sexual orientation, race, and even their emotions, but they investigate it in a kind of self-analysis. In other words, subjectivity itself becomes part of the investigation itself that materializes in self-reflective research.
- In this way, the boundaries between the object, the subject, and the purpose of the research are blurred.
- The research objective is not only the discovery of the research object but also the self-discovery of the researcher himself.

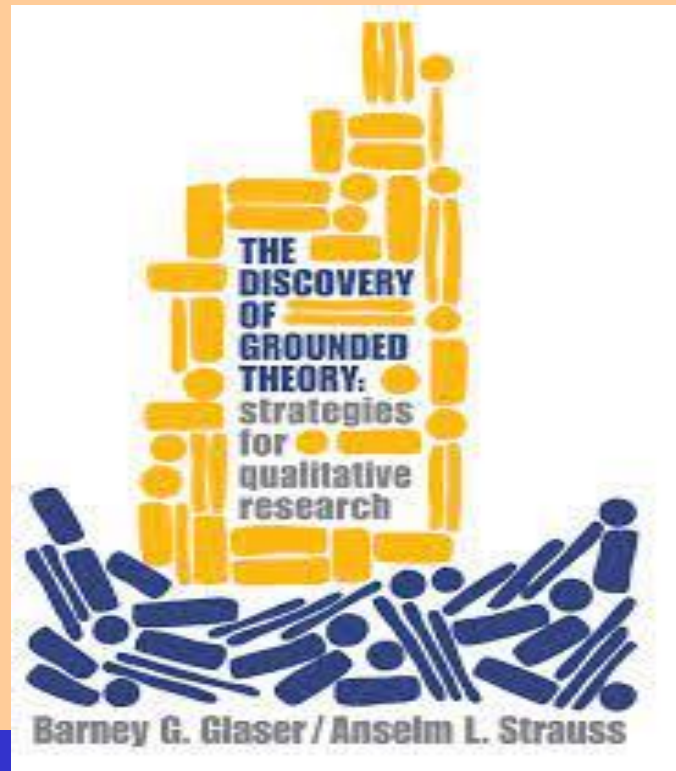


# Grounded theory

- Grounded Theory is the discovery of theory from data systematically obtained from social research. The theory so generated is 'grounded' in data that has been systematically collected and analyzed.
- The goal of Grounded Theory is to generate theories that explain how some aspect of the social world works, i.e., to develop a theory that emerges from reality and is therefore connected to the reality that the theory attempts to explain.
- This contrasts with theory generated by deductive logic from a priori assumptions.
- Grounded Theory seeks not only to understand, but also to build a theory about a phenomenon of interest. Thus, a theory does not arise spontaneously. Rather, it is generated and developed through the researcher's application of the constant comparative method.

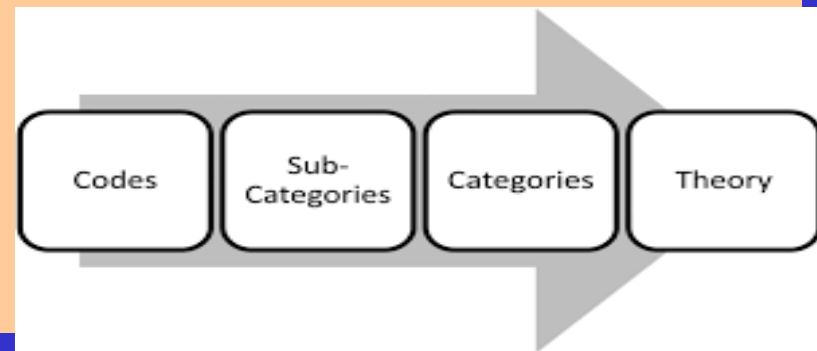
# Grounded theory and the research problem

- It is the research process that generates the research problem and the research question.
- The researcher enters the field of study without the narrow research questions or hypotheses that are common in other research, including other qualitative research.



# Grounded theory: Constant comparative method

- The Constant Comparative Method allows the researcher to develop theory derived inductively from the collection and analysis of empirical data.
- The constant comparative method is more than a set of procedures: it is a way of thinking and looking at the world.
- The generation of theory from data means that hypotheses and concepts not only come from empirical data but are also systematically worked out in relation to the data throughout the research process.

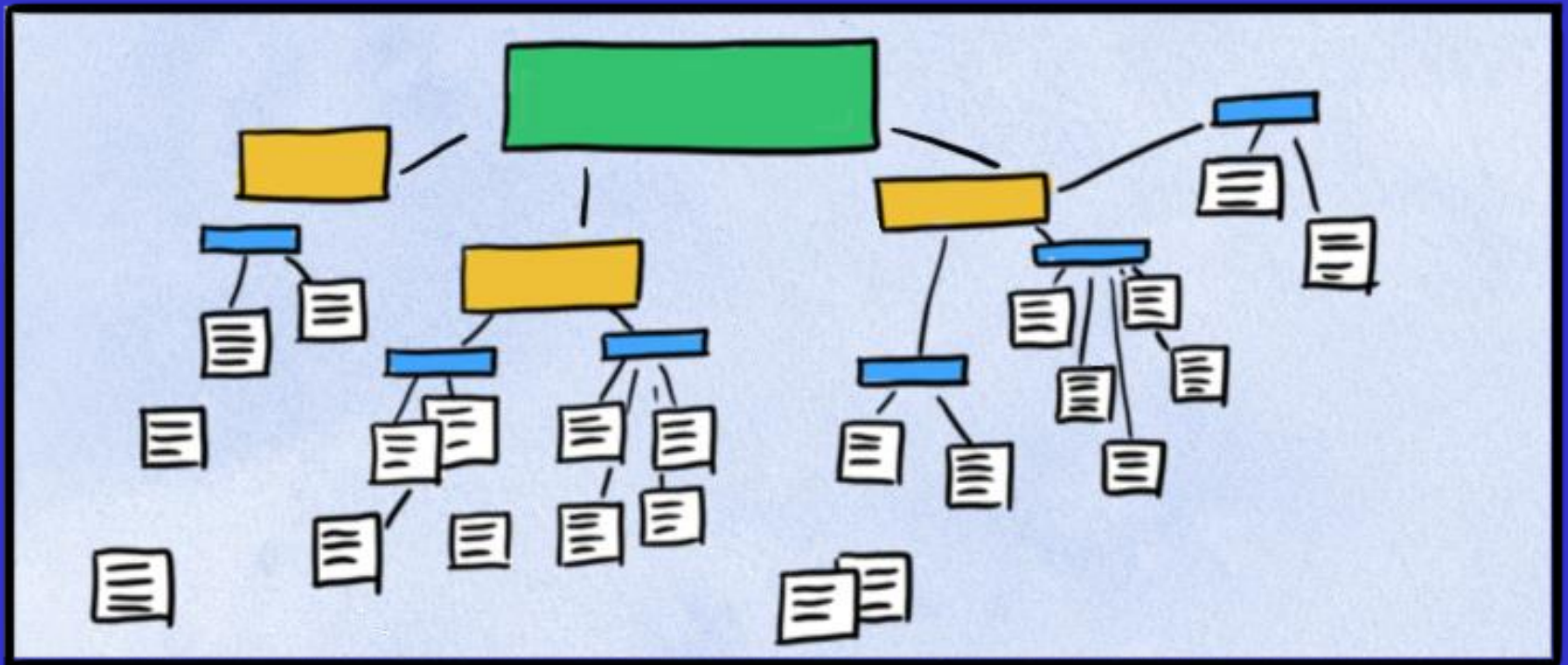


# Grounded theory: Constant comparative method

## **This method involves:**

- Identifying a phenomenon, object, event or setting of interest.
- Identifying a few local concepts, principles, structural or process features of the experience or phenomenon of interest.
- Making decisions regarding initial collection of data based on one's initial understanding of the phenomenon. Further data collection cannot be planned in advance of analysis and the emergence of theory.
- Engaging in theoretical sampling: the key question is what group or subgroups does the researcher turn to next to collect data? Subsequent sampling decisions should be purposeful and relevant.
- The rationale for selecting comparison groups is their theoretical relevance for fostering the development of emergent categories.

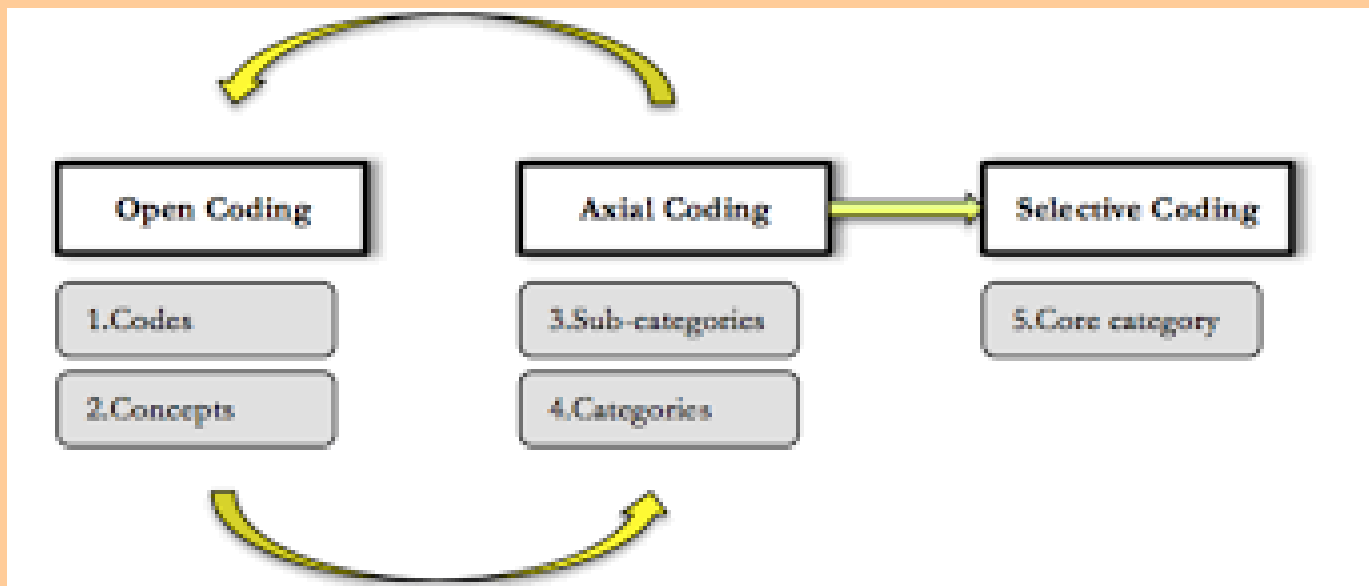
# Grounded theory: Constant comparative method



# Grounded theory: Coding

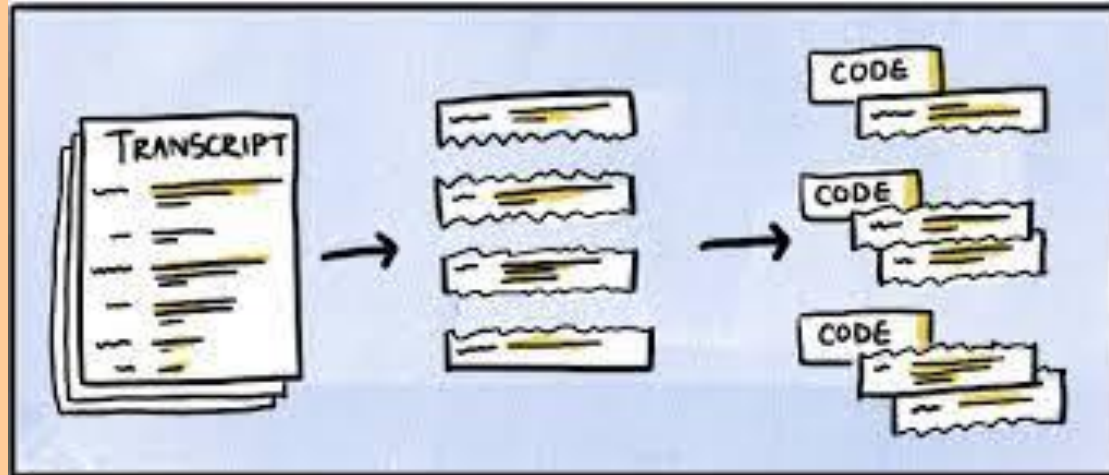
In Grounded Theory, data collection and analysis are continuous and simultaneous.

The basic idea of the Grounded Theory is to read and reread empirical data and discover or identify categories, concepts, and properties and their interrelationships through a coding process that includes three fundamental steps: open coding, axial coding, and selective coding.



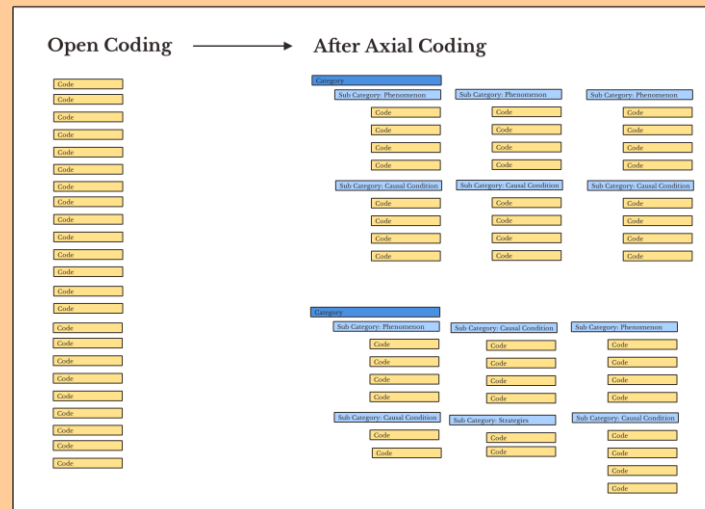
# Grounded theory: Open coding

- Through the open coding process, the researcher conceptualizes the data, **creates codes**, and continues sampling based on the need to further investigate the identified concepts and codes.
- The purpose of open coding is to compare and contrast similar events or characteristics among empirical data.



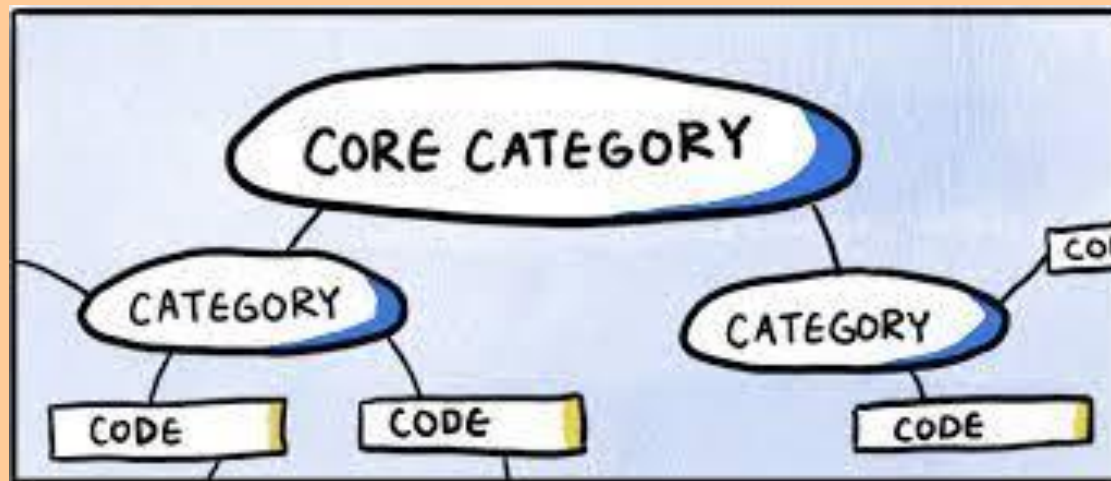
# Grounded theory: Axial coding

- In axial coding, the researcher begins to organize and make connections between the codes created during the previous stage.
- The researcher evaluates the data and creates **categories** based on these codes.
- Categories can be created from existing codes; or the researcher can create new ones that embrace multiple codes.
- At the end of this stage, the researcher will have a series of categories, which constitute the research axes.



# Grounded theory: Selective coding

- The researcher connects all the categories around a **core category**, around which the relationships between categories and subcategories are identified.
- This central category can come from elevating one of the categories created during axial coding; or the researcher can create a new category based on the previous ones that encompasses all of them.



# Grounded theory: Coding

- After collecting additional data, the researchers return to analyzing and coding data, and use the insights from that analysis process to inform the next iteration of data collection.
- This process continues until a strong theoretical understanding of an event, object, setting or phenomenon has emerged.



# Grounded theory and the theoretical framework

- Grounded Theory in its original version is a purely inductive methodological approach that rejects the idea of a theoretical framework to guide research (Glaser and Straus, 1967), as prevails in quantitative research, which starts from a theoretical system that is applied to empirical data.
- The literature review plays an important role, but unlike logical-deductive research, reading existing theories requires a delicate balance between these theories and the data that emerges from the fieldwork. Glaser and Strauss (1967) warn that the literature must be cultivated within the framework of the data collection process and its analysis within the framework of the generation of Grounded Theory. Moreover, other theories embodied in authors' publications must be treated as empirical data and subject to the same method of constant comparative method.

# Grounded theory and the literature review

- The literature review plays an important role, but unlike logical-deductive research, reading existing theories requires a delicate balance between these theories and the data that emerges from the fieldwork.
- Glaser and Strauss (1967) warn that the literature must be cultivated within the framework of the data collection process and its analysis within the framework of the generation of Grounded Theory.
- Moreover, other theories embodied in authors' publications must be treated as empirical data and subject to the constant comparative method.



# Conclusions

- The conclusions summarize the discussions of the whole research work.
- They have to restate the problem, the hypothesis, and the major findings. They also needed to remind the reader of the relevance of the project.
- They may also include directions for future research and/or make recommendations based on the implications of the research project.

# The methods used in legal research: epistemological contexts



# The legal methods: context of discovery

- There is no single or even systematic method for the discovery of law.
- Every discovery has an irrational element or a creative intuition.
- Ideas taken from social practice, governmental policies, cultural artifacts, other theories, other disciplines, legal texts, and personal experiences.
- The great works of the greatest jurists of all times are not the product of what we now call research or even a systematic process.
- The method of producing legal knowledge in the context of discovery is as anarchic as in any other scientific discipline.



# The legal methods: context of justification

## Doctrinal legal method

- A systematic process of interpretation, analysis, and critical evaluation of the legal norm, i.e., laws, principles, concepts, and doctrines.
- The researcher discerns, hierarchizes, classifies, and critically reviews the legal norm, places it within a certain legal category, and evaluates its place within the legal order.
- The crucial question that the legal researcher asks with respect to a legal norm is whether it is valid in light of its logical relation to other norms (legal order).

# Doctrinal legal method: Characteristics

- It is used only in Law.
- It is developed in accordance with standards and rules accepted in the legal discipline.
- It uses specific language and specific cognitive skills.
- It includes a high level of criticism.
- It includes the literature review as background and context of the research problem.
- Its research object is the norm (a rule, the law).
- It deals with texts (the norm, auxiliary norms, cases, treaties, journal articles, books, etc.).
- The legal scholar has to interpret all the elements of the text, including grammatical, semantic and extensive ones.

# Doctrinal legal method: Characteristics

- The task of the researcher is to try to decipher the current meaning of the norm as authentically as possible.
- Technically, the hypothesis is actually a pseudo-hypothesis, i.e., a statement that is not empirically verifiable.
- Necessary elements of a research project: literature review (bibliographic review), historical analysis, content analysis (by reading legislation, jurisprudence, doctrine and other documents).



# Doctrinal legal method: Characteristics

- It involves a rigorous systematic exposition, analysis and critical evaluation of legal rules, principles or doctrines and their inter-relationship. It arranges the existing law in order and provides thematic parameters for such an order. It also concerns with critical review of legislations and of decisional processes and their underlying policy.
- It also provides the systematic exposition of the rules which are governing in a particular legal category.
- It involves a critical conceptual analysis of all relevant legislation and case law to reveal a statement of the law relevant to the matter under investigation.

# Context of justification

- Identify the structure of the legal problem.
- Identify the key concept/concepts in the hypothesis and the key indicators for each concept.
- Identify the relevant legal norm/s (data/research object).
- Identify relevant secondary sources (rulings, treaties, foreign legal norms, political documents, parliamentary debates).
- **Explain the legal norm/s, analyze its/their context, historical origin and / or evolution, compare it/them with foreign norms.**
- **Identify the legal principle (or theory) that is behind the legal norm/s or that governs the relationship between the legal norms (data/research object) and identify the key indicators of that legal principle of theory.**

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# The structure of a research problem

1. Internal inconsistency of the research object.
2. Contradiction between two research objects.
3. Lack of elaboration of a research object.
4. Adequacy of a research object to higher-level research object.
5. The effects or consequences of the research object.
6. Erroneous application of a research object.
7. Comparison and contrast between two research objects.
8. The cause or origin of a research object.
9. The development or evolution of a research object.
10. The lack of sufficient information about the research object.
11. The advantages and disadvantages of the research object.

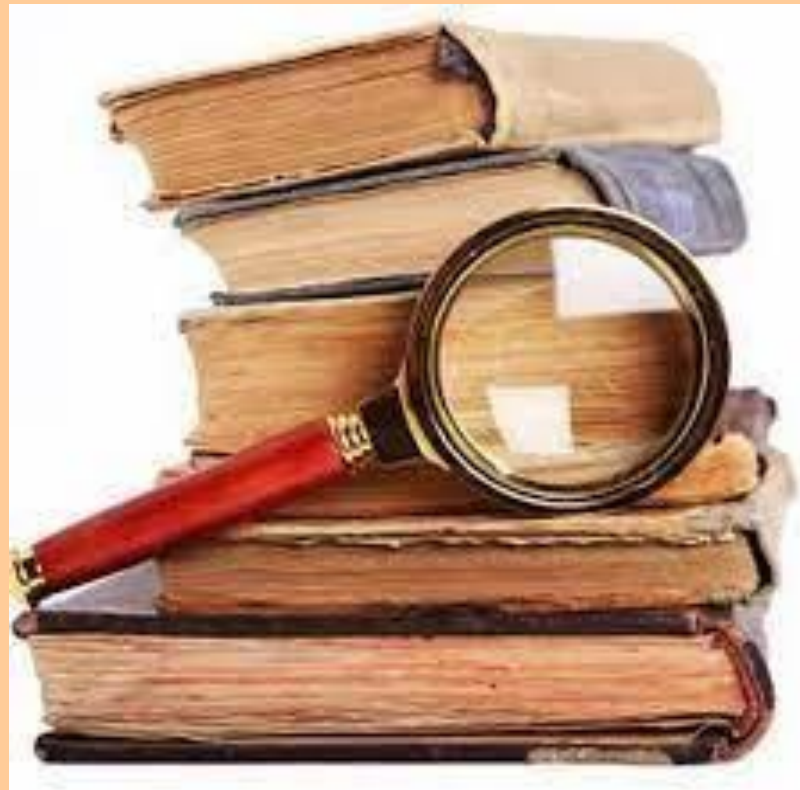


# Context of justification

- Interpret the legal norm/s on the basis of the identified legal principle or theory and its key indicators.
- Internal inconsistency of the research object.
- Contradiction between two research objects.
- Lack of elaboration of a research object.
- Adequacy of a research object to higher-level research object.
- The effects or consequences of the research object.
- Erroneous application of a research object.
- Comparison and contrast between two research objects.
- The cause or origin of a research object.
- The development or evolution of a research object.
- The lack of sufficient information about the research object.
- The advantages and disadvantages of the research object.

# Context of justification

- Reach a tentative conclusion.
- Validate or confirm the conclusion based on the criteria of authority, logic, public policies, social context, etc.
- General recommendation.



# The legal methods: context of application

## Legal method

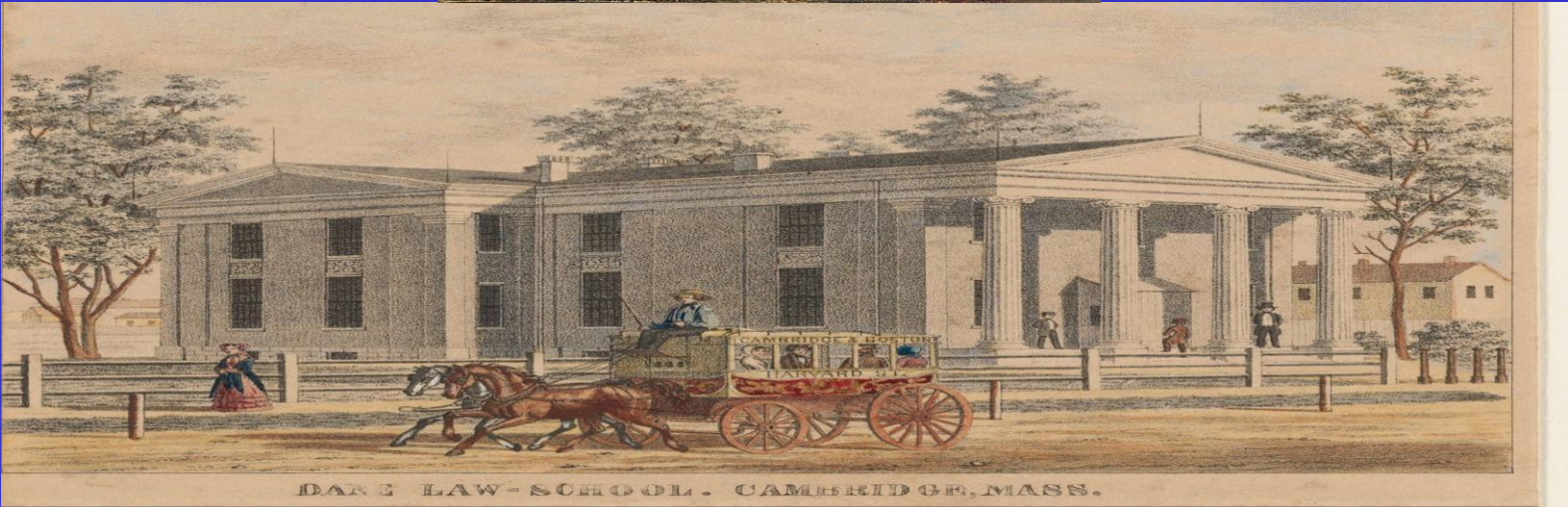
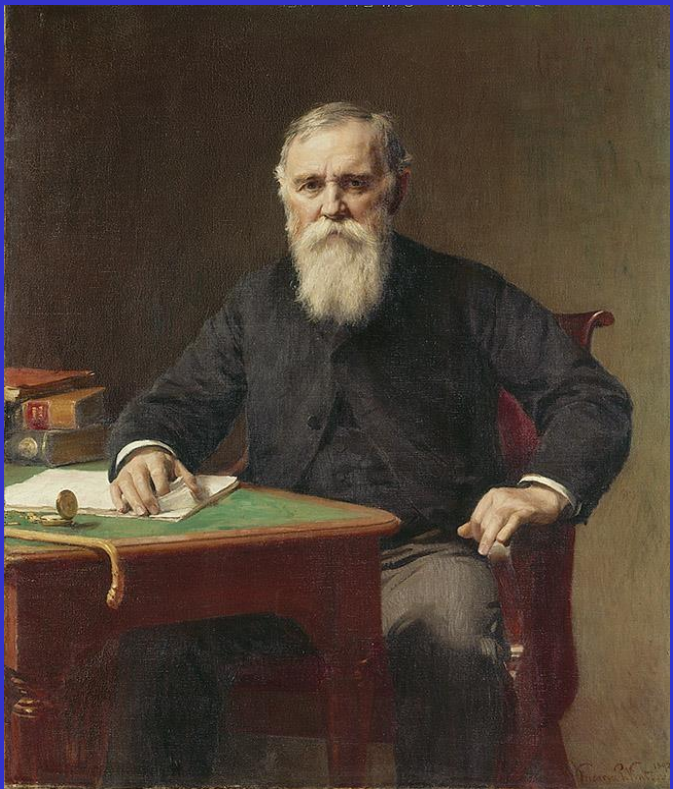
- Agreement on the how and the what for of the method.
- What for: to predict (common law) or to influence (civil law) the outcome of a court decision.
- How: data or facts (the object of study in law can be observed in an inductive way and through deductive reasoning a valid conclusion can be reached, i.e., a uniquely correct result for the case in question.
- Disagreement on what the data or facts are.

# The legal methods: context of application

## Facts

- Legal facts to be found –through empirical observation- in appellate cases (Langdell).
- A body of reports, of treatises, and of statutes (Holmes).
- Principles of natural law (Natural Law scholars).
- The ideology that animates the judges and motivates their actions (Ross).
- The rules of conduct derived from –Roman- history and society (Savigny).
- The *homo juridicus* and his/her practices and what drives his/her conduct (European Legal Realists).
- The body of laws in effect in a given jurisdiction (Kelsen).

# Christopher Columbus Langdell: The Case Method



# Christopher Columbus Langdell

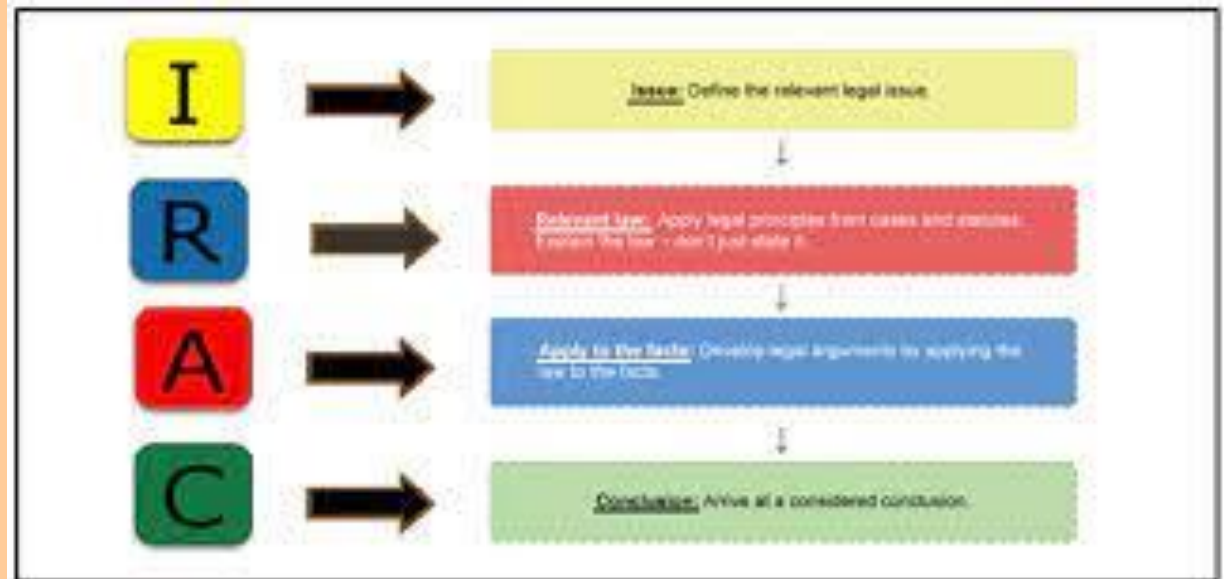
- The case method, i.e., the dissection of edited appellate cases compiled in a casebook and the analogy of the law library to the laboratory.
- The scientific approach pioneered by Langdell in the 1870's had two components: empiricism and rationalism.
- Langdell argued that legal scholars were also empirical investigators. They sought for legal principles rather than physical rules. The sources of their raw data were legal facts to be found in appellate cases. The rational aspect was the belief that legal reasoning must be deductive.
- The first principles to which deductive method must be applied could be attained not by reason or logic alone but through empirical research in the decided cases.

# The legal methods: context of application.

## Structure

- Most legal writing requires the writer to analyze a set of facts using legal rules gleaned from a primary sources, including cases, statutes, and secondary materials.
- Legal writing has its own specific structure that lawyers use in one form or another: IRAC

- Issue
- Rule
- Application
- Conclusion



# The legal methods: context of application.

## Structure

- **Issue**

- The question or problem that the lawyer is trying to answer (what might bring the parties into court).
- This can be in the form of a question or a statement.

- **Rule**

- The rule or legal principle.
- This may take the form of stating the elements required for a prima facie case.

**I - Issue**

**R - Rule**

**A - Application**

**C - Conclusion**

# The legal methods: context of application.

## Structure

- **Application**

- The evidence and explanation of how the lawyer will arrive at conclusion.
- Citation of other cases, discussion of policy implications, and discussion of cases that run counter to the conclusion.
- Both sides and counterarguments where appropriate.

- **Conclusion**

- The answer to the question identified in the issue.
- The conclusion derives from the logical analysis based on the rule and the facts.

# Law and Social Sciences



# The legal methods and other disciplines

- Legal researchers have always struggled to explain the nature of their activities to colleagues in other disciplines.
- Those from other disciplines consider the method vague, intuitive and archaic. For them, the lawyer does not do research. Legal research is not really academic.
- For lawyers and legal scholars, researchers who use the qualitative methods of social sciences do not do legal research and do not understand the law.
- As Law Schools in North America aim to educate future lawyers, they have taught –almost exclusively- the legal method used in the context of application.
- As a result, there has been a reaction from other disciplines which argue that this method is quite narrow.
- Scholars from Social Sciences have succeeded in imposing on Law Schools the adoption of empirical research of Law.



# Law and Social Sciences

- The Law and Social Science movement adopts the research methods and techniques of the Social Science disciplines, such as Sociology, Psychology, Anthropology, Economics and Political Science, among others to study Law. The research method is always that of the ancillary discipline
- This approach to legal research coexists with the paradigm of dogmatic research.



# Example: Sociology of Law

- Law can be analyzed sociologically as a method of doing something.
- Law can be studied as a social process, instrumented by individuals during social interaction.
- Sociologically, law consists of the behaviors, situations, and conditions for making, interpreting, and applying legal rules that are backed by the state's legitimate coercive apparatus for enforcement.



# Sociology of Law

- Sociology of Law considers legal structures (i.e. the legal system), legal process (how law is made), and the interaction of the law in societal change and social control.
- Sociology of Law understands law as part of social institutions.
- Legal categories and legal reasoning interact with social hierarchies based on race, class, gender and sexuality.
- It analyzes relations between law and social control and social change.
- A sociological interpretation and application of the law does not bar the study of rules. But it differentiates between the proclaimed objectives of legal norms and the actual workings and consequences of law.

# Types of legal research

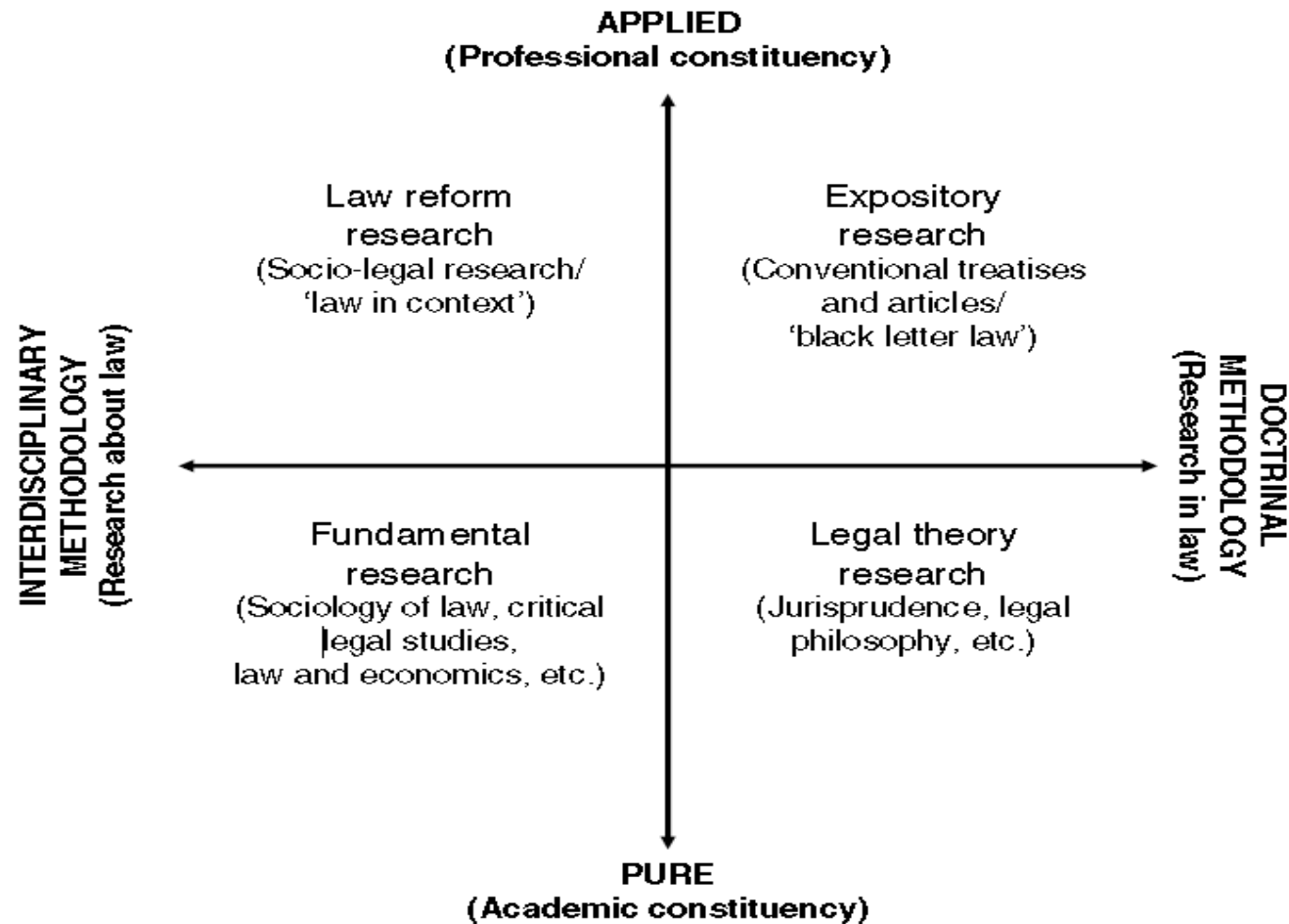


Figure 3.1 Legal research styles (Arthurs, 1983).