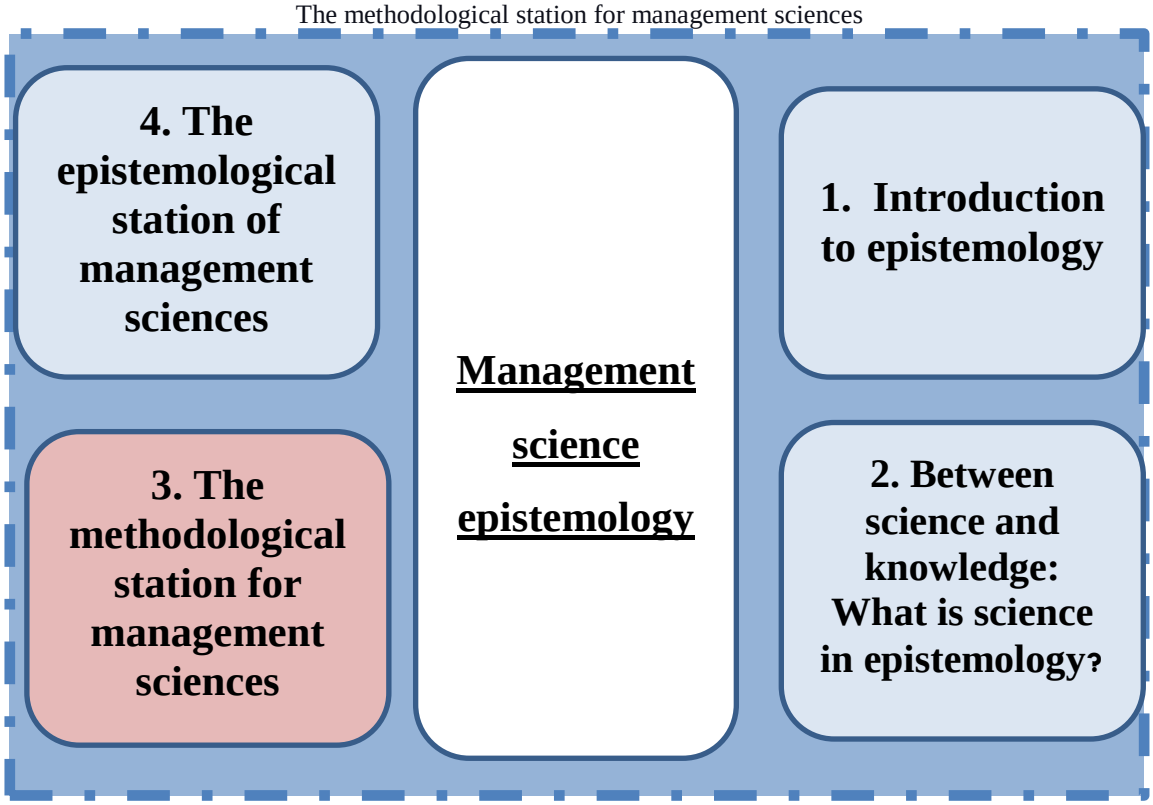
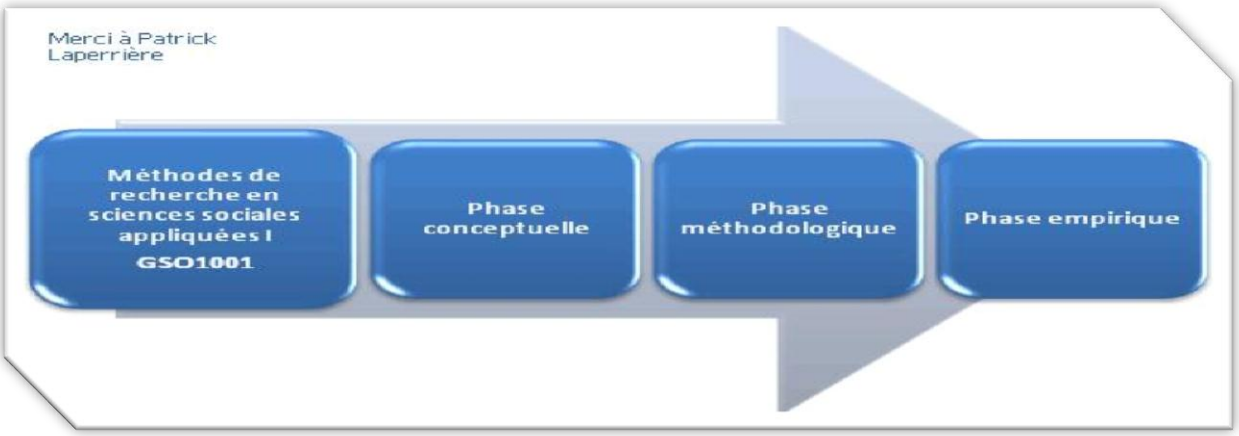
Third chapter:
The methodological station for management sciences



Third chapter
The methodological for management sciences



Source: google image 3

Chapter plan

Introduction

1. **A sneak peek at the methodology of scientific research in management sciences**
2. **Between objectivity and subjectivity in scientific research methodology**
3. **The quantitative methodology, the qualitative methodology and the triangulation method**
4. **The need for the logic tool in the methodology of scientific research in management sciences**
5. **Deductive and inductive reasoning in scientific research methodology and management sciences**
6. **1.5 Induction method**

Conclusion

Introduction

Epistemology is concerned with the study of building knowledge. It is not easy to find a unified definition of scientific knowledge. Some define it as an explanation of reality, and some see it as an innovation or construction of reality (Piaget, 1967). In terms of building a reality, it is our modern realities that new sciences emerge that align with this lived reality. Among these sciences are management sciences, which are called management sciences or organization sciences, as they remain the most modern among all social sciences academically; they are in continuous development and at an accelerated pace. However, due to its shortage, the research findings cannot be generalized (Gavard-Perret et al., 2008).

Management sciences, according to their nature, are modern. This type of science has always lived through a scientific identity struggle due to the need to define a unique topic for it. However, scientific and academic research and contributions supported overcoming this epistemological crisis, which resulted in the emergence of principles, models, methods, approaches, theories, and laws that frame this type of science, which gave this type of science scientific legitimacy and scientific justification (Dabla, 2019).

Management science is a field of research in the social sciences arena, and the subjects under study in management are diverse. There are many fields of research in this type of science. This research focuses on the performance of the organization and the individuals who drive it. We note that there is a considerable amount of knowledge wealth that must be secularized, refute erroneous ideas and theories, and support theories to become administrative principles and laws framing knowledge in management, and this can only be achieved with a clear and rigorous research methodology, which we explain in the following pages, according to Albert (1999). This chapter has been prepared based on a free translation of a group of texts for several references, which are as follows:

Albert (1999)
Audet and larouche (1988)
Bartholly et al. (1978)
Dabla (2023)
ENA (2023)
Fortin (1996)
Gavard-Perret et al. 2008).
Guautier and Bourgeois (2016)
Piaget (1967)
Russell (1961)
Seaman (1987)

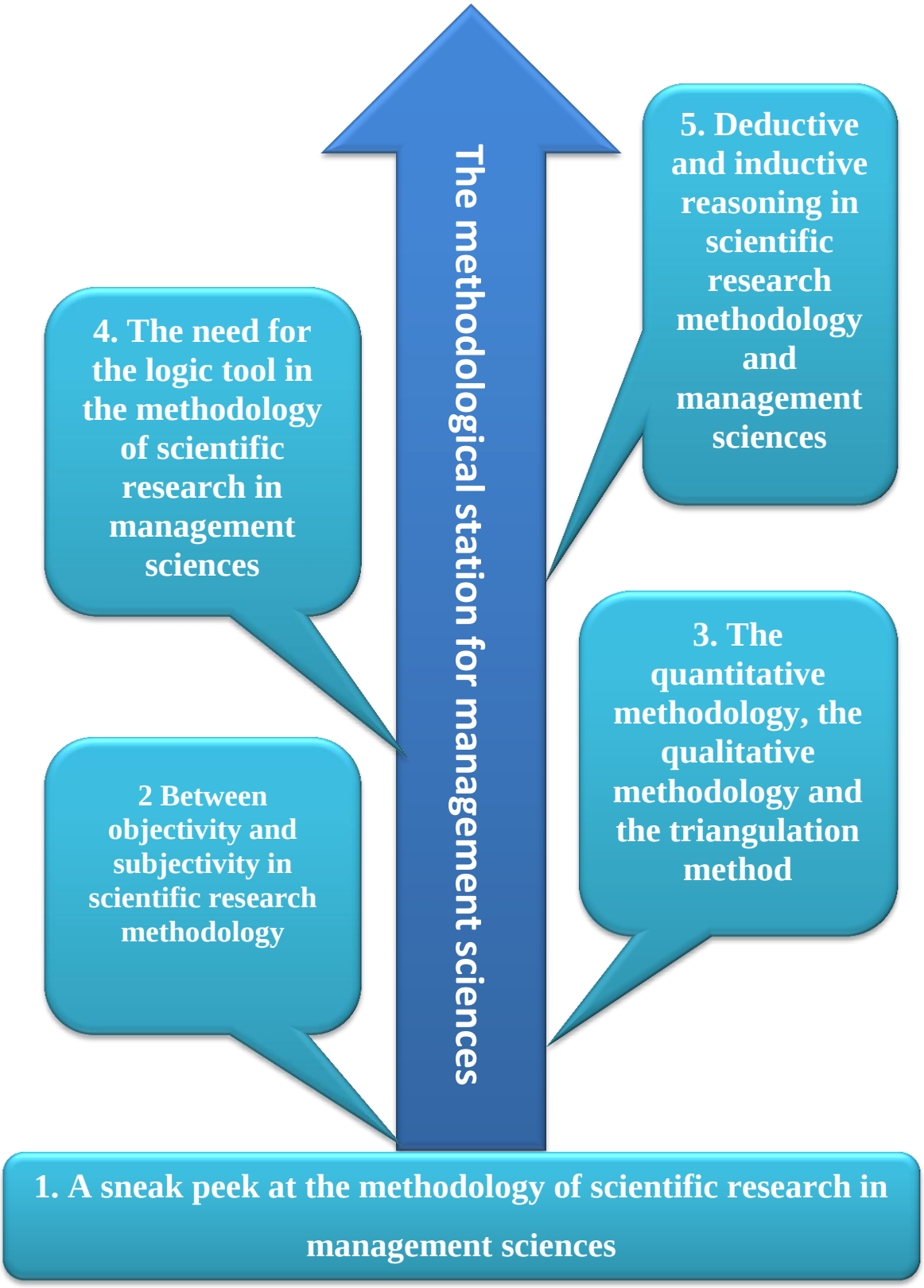


Figure 1: A simplified explanation of the methodological station for management sciences

1. A sneak peek at the methodology of scientific research in management sciences

One of the epistemological goals is to justify the sciences and provide scientific, legal knowledge; this will only come through scientific research. Piaget (1967) describes epistemology as building valid knowledge by examining the methods that allow the construction of this knowledge. By these methods, we mean scientific research methods. Fortin (1996) also shows that scientific research is carried out by a person who specializes in a scientific field to take the initiative to study a scientific phenomenon more rigorously and decisively, and its results are more acceptable, valid, reliable and authentic. Why all this?

Because it is on a rational path that favours investigation, inference and criticism, according to a specific epistemological model, the research has several objectives, including providing a theoretical and scientific contribution. As well as providing a field contribution in the form of providing field solutions to the scientific phenomenon under study in the form of proposals or recommendations, as well as providing research horizons for the subject under study, and this is according to the criteria of stability, credibility, validity and reliability.

Research is an organized and systematic work, according to the possibility of verification, confirmation and refutation. It begins with collecting observable and verifiable data using scientific experiments or quasi-experiments. Then, the study results are based on the sample or even the study population, whether the research is quantitative or not qualitative (Seaman, 1987).

The methodology is the research tool, and in turn, it uses methods and techniques to reach, discuss and interpret the results, so the research takes the characteristic of systematic organization and practical rationalization of the observation function. The research must not have a persuasive function, such as the task of the orator on a platform of rhetoric. The research is far from being a propaganda process of learning. It cannot be used as justification material for a case of a phenomenon. Research is a coherent method of sequential and collaborative steps. Among them is to show a fact of the facts according to scientific assumptions that can be achieved, verified and refuted, **ENA**.

In the methodology, the research begins with skepticism. It is based on the principle of skepticism. It begins with an observation of a scientific phenomenon in the field. The research begins with a problem that ends with a general question, which in turn ends with specific questions that, in turn, form research hypotheses. The goal is to understand the foundations of

the phenomenon; Knowledge questioning is inseparable from the practice of scientific research. Everyone begins with a question and ends with a result. Research starts from a scientific theory, and the current research in this process is to prove the theory's validity or refute it by realizing or refuting the scientific hypothesis related to the theory. The ultimate goal is to reach principles and laws of confirmed theories frame all life in this sprawling universe ENA.

2. Between objectivity and subjectivity in scientific research methodology

The methodology also ensures that scientific research is objective and prefers to avoid subjectivity as much as possible. It seeks methodological neutrality, and this is to give it the desired scientific feature. From methodological neutrality, no recourse should be made to support a position or idea already taken.

Within the methodology framework, we note that knowledge is surrounded by a struggle between objectivity and subjectivity, including objectivity and subjectivity, two concepts that are contradictory in meaning. The first concept gives meaning to scientific research and makes it strict in place. As for the second meaning, the researcher's personality interferes with the subject of the research being studied, so it is impossible to separate between the research topic and the researcher's intervention in directing the research according to his will; this is unscientific and methodologically unacceptable.

Larouche and Aduet (1988): confirm that, according to Dabla (2019, p. 04): "Methodology: Refers to the scientific or non-scientific science in the way of preparing laws, principles, collecting data, interpreting or justifying it, and it falls into two methodologies:

Idiographic: How a subjectivity based on daily presence in social life: biography, journal, etc;

Nomothétique: quantitative, objective, based on technical, statistical, etc. methods.".

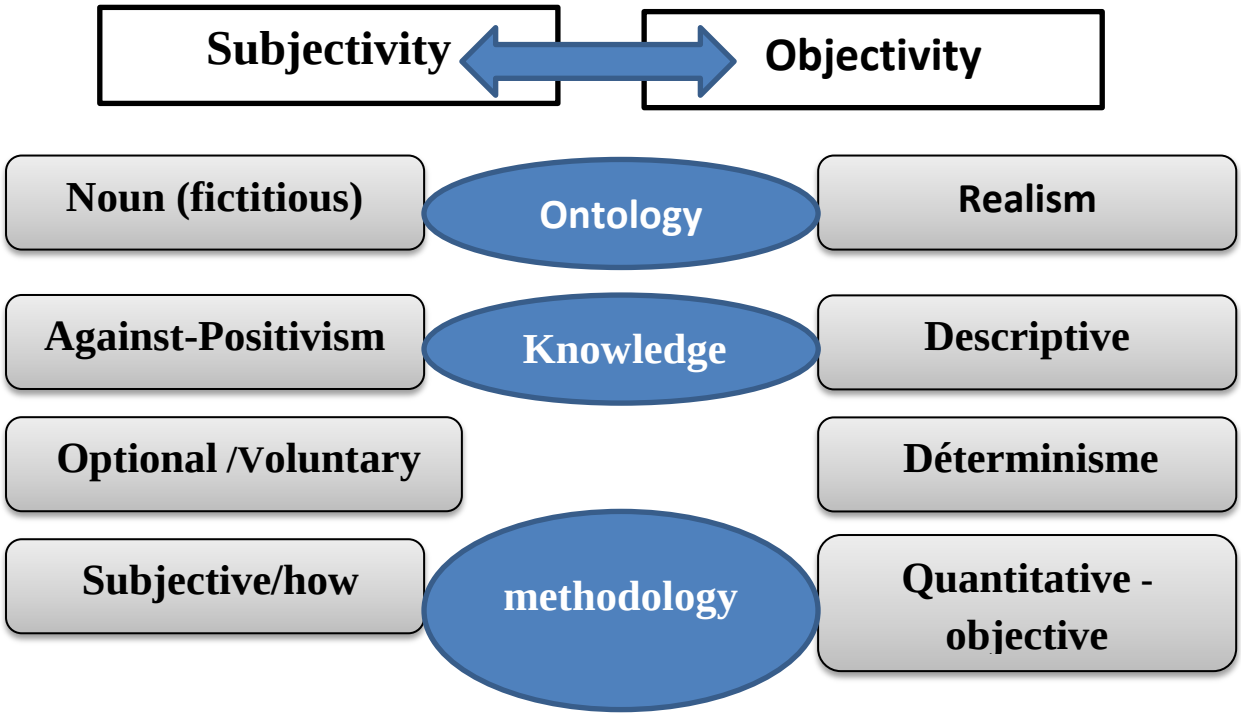


Figure 2: Fundamentals qualification of science
Source: Audet (1988)

1. **The quantitative methodology, the qualitative methodology and the triangulation method**
2.

In management sciences or organizational sciences, there are three approaches to research, namely: the quantitative approach, the qualitative approach, and the triangulation approach, i.e. combining the advantages of qualitative research and then quantitative research, according to (Dabla, 2019) and they are:

1. **Quantitative research** is deductive, inferential research that depends on quantified variables by analogy. This approach descends from the behaviourist school that studies the behaviour of observed scientific phenomena to investigate their paths and actions in the past and present to conclude results that we can benefit from in the present and the future. There are even predictive inferential quantitative studies. This method was developed in North America, including Canada and the United States of America, and is based on statistics and the application of statistical techniques and methods.
2. **Qualitative research** is inductive and interpretive research that studies a case or a group of cases. The researcher studies phrases or words; these data are analyzed with a

correlation matrix. Data analysis has been updated with media programs that quantify the relationships between nodes, and this methodology has developed in the social sciences. This research method was developed in Europe due to the complexity of social phenomena that need to be deeply understood.

3. To take advantage of the qualitative, exploratory, and quantitative, confirmatory, affirmative, we start with the case study method and then follow the study of the variables. This synthetic method is called triangulation. This scientific method and its requirements were consolidated to remedy the deficiency. "The quantitative method often neglects the complexity associated with the phenomena of organizations and focuses on the impact of accuracy and regularity" (Dabla, 2019, p. 14). This is compensated by the in-depth study of the scientific phenomenon through a case study or qualitative study that is elementary, i.e., exploratory, a representation of reality correctly and honestly.

4. The need for the logic tool in the methodology of scientific research in management sciences

According to Bartholy et al. (1978), historically, logic appeared in the fourth century AD: its inventor, Aristotle, had some modifications until the advent of logic at the end of the twentieth century; the invention of this "tool" whose usefulness has been proven to be fundamental to all sciences. In the era of Aristotle, a kind of deceptive thinking appeared, known as "sophistry," which was valid at this time; the subject of logic is proving the validity of thinking or what is called a syllogism. This characteristic makes it possible to understand why a syllogism is formal thinking that can be valid. It is that which follows logical conclusions based on premises of any kind. We can thus have four types of thinking which the possible groups of reasoning faculties determine.

We point out that the truth of these logical issues is of paramount importance to understand what distinguishes the activity of logic from that of scientists who study physical and human phenomena; The activity of logic is concerned only with the validity of reasoning; So by logical inference, what we want to stress, first of all, is that the premises imply the conclusion and not that the premises and conclusion are valid.

The need for a logic tool is the study of the correctness of thinking, especially in the science of organizations. Logic must necessarily resort to symbolic language, and this is not merely an abstraction characteristic, as it is used in the language of mathematics. If the content of assumptions is not essential, we can and must replace them with symbols. It is chosen in whatever capacity, so Aristotle had his logical present (Bartholy et al., 8(197).

Table 1: Logical issues and type of conclusion

Source: Bartholly et al. (1978).

The number	Type of logic and type of conclusion		Causes
1	**Right reasoning, right conclusion:**	**A**	All medicines taste bad;
		B	Octavid is a medicine;
		C	Even Octavid tastes bad.
2	**Right reasoning, wrong conclusion:**	**A**	The oil crisis affects the whole world;
		B	Primitives belong to this world;
		C	So, primitive peoples are affected by the oil crisis.
3	**Incorrect reasoning, correct conclusion:**	**A**	All right-wingers call themselves apolitical;
		B	All real estate developers call themselves apolitical;
		C	So, all real estate developers are right-wing people.
4	**False inference, wrong conclusion:**	**A**	All parasites are irritating;
		B	Talkative people are irritating;
		C	Therefore, Talkative are parasites.

A simple examination of these examples will show the independence and validity of the truth; The proper conclusion does not confirm that the reasoning is correct (not in example "1" and not in "3"); On the contrary, the validity of reasoning teaches us nothing about the truth or falsity of its conclusions; It is necessary to prove the logical truth so that the validity of the inference guarantees the truth of the conclusion as in the example "1" and not in "2" (Bartholy et al., (1978).

According to Figure 3, the conclusion or deduction (Dabla, 2019) goes from general to specific. If done as required by the norms, the results of this type of perception must convince a person even if he is stubborn or, as Blang (1992) says. It can later be a test subject by deduction.

Inductive logic in the methodology of scientific research imposes itself strongly in our present time due to the complexity of the scientific phenomena to be studied. It studies the phenomenon according to the qualitative approach or what is called qualitative. That is, it deals with phrases or rather words. Considering taking one case in the field and doing an in-depth study from all aspects and taking a large number of concepts or dimensions simultaneously and subjecting it to a qualitative study, i.e. qualitative, the goal is to reach a theoretical framework.

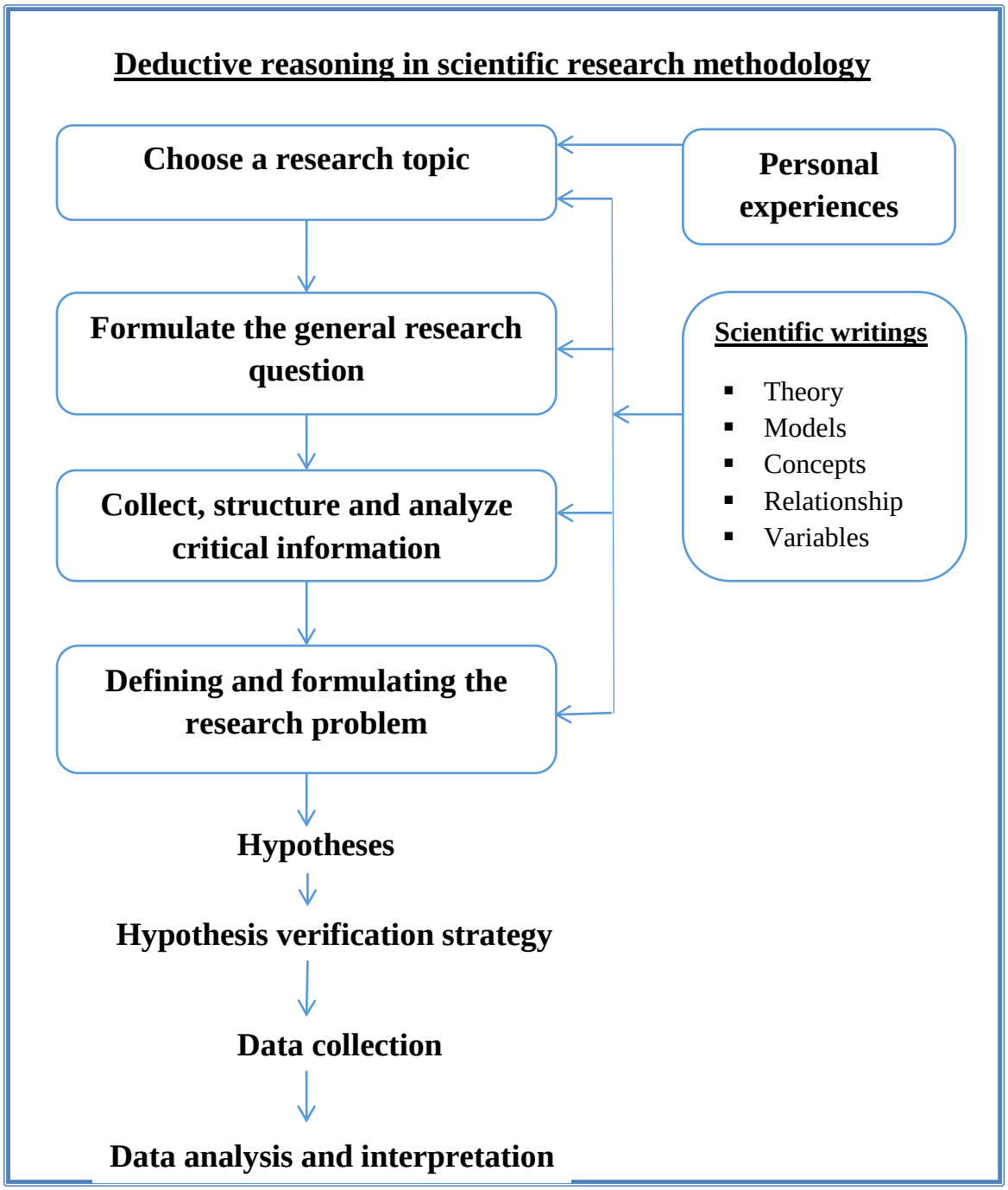


Figure 3: Deductive perception in scientific research methodology
Source: Gauthier and Bourgeois (2016)

We carry out this type of study in two cases: the first is that the subject of the study is new and has not been studied before and that this phenomenon is complex in a way that the researcher cannot understand smoothly, and secondly, if the sample is tiny, it is impossible to do deductive work, according to (Dabla, 2019), then induction: It is taking it from the specific to the general, and it is considered illogical; Non-demonstrative inference (induction). At best

it can convince a rational person. However, induction and deduction are contradictory in terms of method and complementary and can coexist in terms of function despite their differences, according to Thiétart (2003).

Table 2: Examples of thinking styles
Source: Albert (1999)

ABC **Deduction**	**A**	**Rule:** All the peas in this bag are white
	B	**Condition:** these peas from this bag
	C	**Result:** these peas are white
BCA **Induction**	B	**Condition:** these peas from this bag
	C	**Result:** these peas are white
	A	**Rule:** All the peas in this bag are white
CBA **Abduction**	A	**Rule:** All the peas in this bag are white
	C	**Result**: these peas are white
	B	**Condition:** these peas from this bag

Conclusion, induction, and exclusion are three modes of thinking, that is, three methods or three approaches to conducting scientific research.

The first is deductive logic, "Déduction" is an approach frequently used in scientific research in management sciences. It begins with a rule and then uses a case. A large sample of cases is used to test this sample statistically, and then we conclude a conclusion. The rule is theoretical or derived from theory, and access to the result uses the hypothesis attached to the theory. The hypothesis links the theory, the research subject (the case) and the process of statistical analysis.

The second of them is Inductive logic, it is an approach that began to be used extensively in recent times throughout the world and has always been fought before. It is used a lot in North America. It begins with a case or several cases. However, they are numbered and end with a rule, or a theoretical framework, which in turn leads to the mourner as a mediator, using the result to treat the scientific phenomenon represented by a case study or a group of cases.

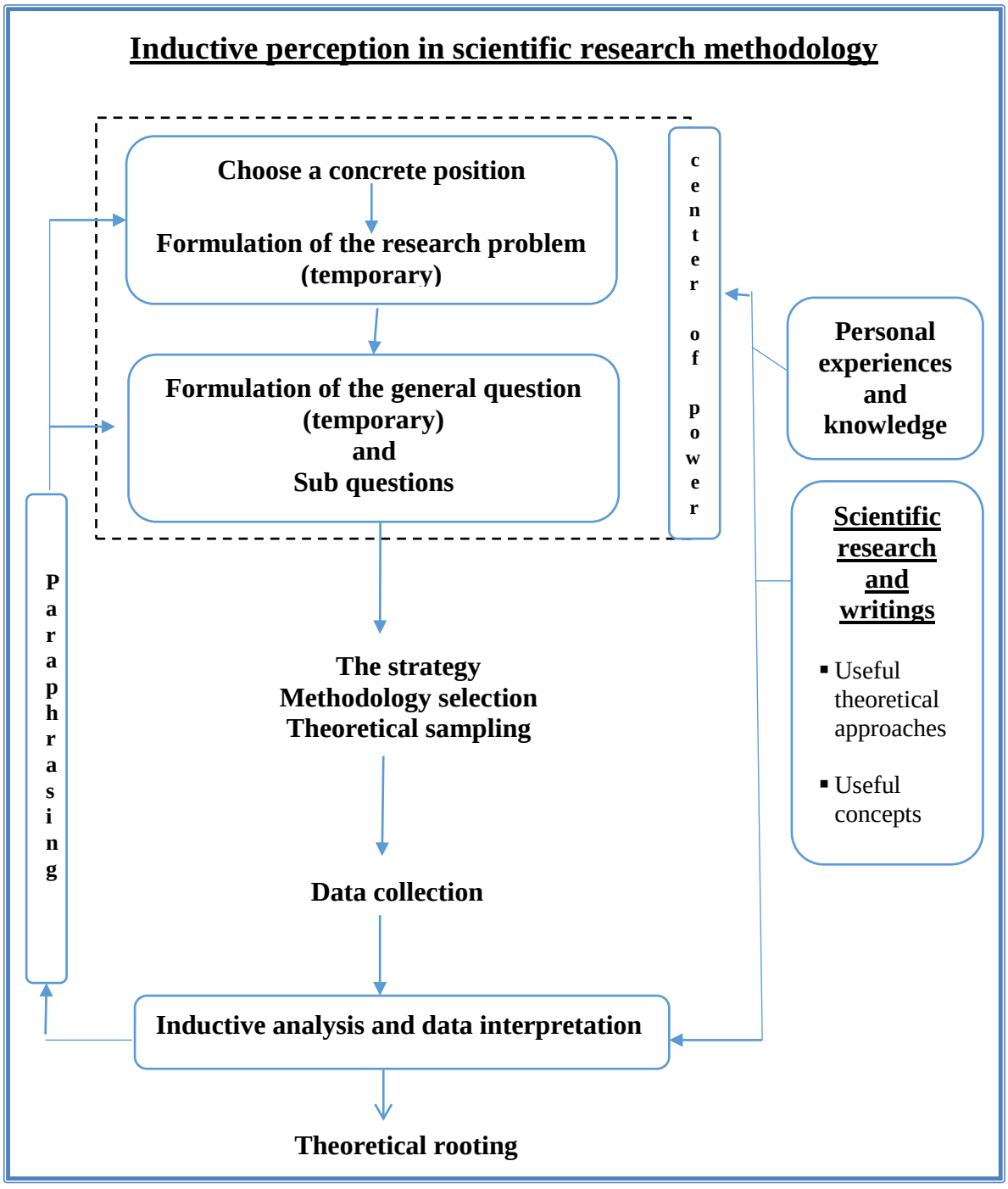


Figure 4: Inductive visualization in scientific research methodology
Source: Gauthier and Bourgeois (2016)

The third is Abduction, it is a third approach, and it is one of the types of informal induction, according to Koenig (1993), because it searches for a conclusion to a situation that comes from a result in which it is used not only in one case, but in several cases, and this is based on a specific rule that corresponds to research topic;

Albert (1999) says that deportation is a process that does not belong to logic, as it helps to find an explanation for the scientific phenomenon (the case) in order to support the base (theory) in management sciences.; The logic of exclusion is an inferential process that opposes the logic of deduction, which stems from the fact that the hypothesis based on the base, i.e. the scientific theory, is for both exclusion and deduction. The deduction is based on specific values. According to general logic, induction allows general rules to be given "A," while exclusion suggests hypotheses. B", below we give an example of exclusion logic.

Table 5: Example Abduction
Source: Albert (1999)

CBA **Abduction**	**A**	**Rule:** If it is raining, the road is wet
	C	**Result**: the road is wet
	B	**Condition:** If it is raining

5.1. Induction method

Induction is an approach that consists of deriving conclusions from a list of data or data collected from the field of the scientific phenomenon under study, and from it, in the field, if you observe at a particular time all the blackbirds in an area, you will conclude that all the blackbirds are black; but this definition requires a certain number of observations of flocks of blackbirds in multiple places, and this requires several observations, according to Weber (1993),

First Observation: Induction is the preferred approach of empiricists because it assumes that observation in the sense of 'feeling' is the starting point of knowledge.

Second Note: It is clear from our definition that inductive knowledge cannot be considered specific; data collection is rarely comprehensive, and observations are not endlessly

repeatable, so there is always a fear that a new observation will conflict with previous observations. From a logical point of view, the latter can be expressed as the unique "there is at least one blackbird that is not black," which is sufficient to negate the opposite proposition (all blackbirds are black).

Third Observation: The example that we have taken, like all examples of induction, contains a false element: to deduce anything about the blackbird, one must first determine what the blackbird is. Otherwise, if we have formed the concept using the inductive method, this can only be done through a multiplicity of observations. This method contains a vicious circle: I know the blackbird is black, not black, because it is black. The introduction is nothing but the logic used in current thought, which results in the formation of linguistic concepts, not scientific concepts.

Fourth Observation: Induction is a primitive method of knowledge, more practical than scientific: it is found in taxonomic sciences such as botany, zoology, etc., which do not state the laws, except in some empirical senses; for this term. Establishing laws that take science from its inductive stage to its hypothetical deductive stage assumes the development and verification of hypotheses through experimentation (physics, biology) or observation.

Feedback

In induction, the use of the scientific method will be in this approach as follows, always according to Weber (1993):

First, all facts will be noted and recorded without prior selection or evaluation of their relative importance;

Second: the facts observed and recorded will be analyzed, compared and categorized without hypotheses or assumptions other than those necessarily implied by the logic of thought;

Thirdly, from this analysis of the facts, general conclusions may be drawn using induction that confirms relationships of classification or causation between these facts;

Fourth: subsequent research will be deductive after inductive research and use inferences from predetermined general results.

There are four stages of data in ideal scientific research:

The first stage: monitoring and recording all data;

The second stage: analysis and classification of this data;

The third stage: deriving general data by extrapolation from these facts;

The fourth stage: Additional checks of public data. It is emphasized that, in the first two steps, no assumptions or hypotheses should be made about how the observed facts relate to each other; the feeling has imposed this limitation that such prejudices would affect and endanger the scientific objectivity of research.

5.2 Induction and Theory

The failure of Bode's law provides apparent evidence of the fragility and, in fact, recklessness of induction of general assumptions by observing only a few cases of the subject matter. Sometimes generalization fails almost immediately; and sometimes it is correct, no matter how many extra notes. Unfortunately, no one makes valid generalizations by observing a limited number of particular facts in the field of research.

None of the attempts to prove a valid method of inductive reasoning by which theories can be deduced from facts have succeeded. The researcher does not infer his theories from the field data in any logical sense of the word "inference." Instead, he invents, fantasizes, or builds his theories. He used many suggestions and clues from these accurate data that reflect reality. The researcher often uses comparisons with other better-known or understood situations. However, the researcher can never assert that "because the facts are such and such, then this theory is true" in the sense that the researcher can never assert that "since the axioms and definitions are such and such, this theory is true, according to Hacking (2001) and Weber 993).

Summary

Management sciences are sciences of modern origin. They have deservedly imposed themselves on the cognitive epistemological arena. They have several sources that make them rich material for scientific research according to a specific methodology for this type of science. This methodology has been presented in this chapter. Briefly, the essential methodological features in the framework of the search for objectivity were exposed in order to remove the dimensions of the researcher's intervention during the research process or the conclusion of the results. It is vital to support the scientific knowledge obtained according to the epistemological principle recognized in management sciences.

During the systematic presentation of management sciences, three methods were concluded for conducting scientific research: deduction, induction, and triangulation. Deduction or

inference is the quantitative approach based on statistical and standard methods that use a large sample of hundreds in a considered society. This method seeks to generalize the results to the sample and from it confirms the theory, which explains the research subject, to a principle or law that frames the reality of management.

As for induction in its approach, as we explained above, it is the inverse of the quantitative approach, as it depends on one or several limited cases. The epistemological goal is a theory or a theoretical framework that explains the scientific phenomenon under study. In the triangulation approach, the researcher combines, in one research, the advantages of the qualitative or qualitative approach with the advantages of the quantitative approach in order to obtain reliable, valid, and valid results.

List of references

Principal references

- Albert D. (1999) « Logique épistémologique et méthodologie en sciences de gestion . Université Paris-Dauphine (DMSP, LAMSADE) , Ecole des Mines de Paris (CGS), Conférence de l'AIMS, Mai 1999.

- Bartholy Marie Claude, Despin Jean-Pierre et Grandpierre Gérald. (1978). La science, Épistémologie générale. Paris, éditions Magnard. France.

- دبلة فاتح. تحديد الموقف الابستمولوجي و المنهجي للباحث في علوم التسيير، كيف و لماذا؟ (2023) - dspace.univ-ouargla.dz][ ] على الخط [https://dspace.univ-ouargla.dz/jspui/handle/123456789/2178 (أستشير يوم 06 أفريل 2023)

Secondary references

- Audet, M et Larouche, V (1988) « Paradigmes, écoles de pensée et théories en relations industrielles », Relations industrielles, Vol, 43,N°1, 1988, p 4

- ENA (2023)

- Fortin M-F. (1996). Le processus de la recherche: de la conception à la réalisation. Edition, Décarie.

- Gavard P., Lavure M., Gotteland D et Jolibert A.. (2008). Méthodologie de la recherche : Réussir son mémoire ou sa thèse en sciences de gestion. Paris, France, Pearson Éducation.

- Gauthier B. et Bourgeois I. (2016). Recherche sociale de la problématique à la collecte des données. Presses de l'Université du Québec, Québec, Canada.

- Hacking I. (2001). Entre science et réalité; La construction sociale de quoi? Paris, La Découverte

- Image : google 8. (2023). Image sur google [En ligne] : https://www.google.com/search?q=M%C3%A9thodologie+de+recherche%2C+epistemologie%2C+sciences+de+gestion&hl=fr-ca&tbm=isch&source=hp&biw=1600&bih=757&ei=gEguZN7NAe6s5NoP3YeAqAY&iflsig=AOEireoAAAAAZC5WkH51e3LW0So810nnPBJ1dK48ATzJ&ved=0ahUKEwjejY7Os5T-AhVuFlkFHd0DAGUQ4dUDCAc&uact=5&oq=M%C3%A9thodologie+de+recherche%2C+epistemologie%2C+sciences+de+gestion&gs_lcp=CgNpbWcQAzoICAAQgAQQsQM6CwgAEIAEELEDEIMBOggIABCxAxCDAToFCAAQgAQ6BggAEAgQHjoHCAAQGBCABFAAWN3EBWDL2wVoAHAAeACAAZQEiAGlNJIBCzM4LjIwLjIuNS0xmAEAoAEBqgELZ3dzLXdpei1pbWc&sclient=img#imgrc=g8TFp8UC011RPM (Page consultée le 06-04-2023).

- Piaget, J. (1967). Logique et connaissance scientifique. Editions Gallimard

- Russell B. (1961). Introduction à la mathématique. Payot,

- Seaman C. H. C. (1987). Research Methods: Principles, Practice, and Theory for Nursing. Publication Appleton & Lange

- Thiétart, R.A et Coll. (2003). Méthodes de recherches en management, 2ème Edition, Dunod, Paris

- Weber M. (1993). Essais de la théorie de la science? Paris, Plon Agors