

SOCIOLOGY

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Figure 2.2

1. Types of Reasoning:

a. Inductive (or ampliative) reasoning starts with the conclusions drawn by a **scientific theory**, or a **system of ideas intended to explain, especially based on general argumentative premises**.
 Example: *In the past, ducks have always come to our pond. Therefore, the ducks will come to our pond this summer.*

b. Deductive reasoning begins with premises, drawing them from **specific instances**, as with math exercises.
 Example:
$$\begin{array}{l} \text{If } x = 4, \text{ and} \\ \text{If } y = 2, \\ \text{then } 2x + y = 9. \end{array}$$

c. Abductive (or inferential) reasoning takes incomplete data and draws conclusions based on **the most likely explanation**.
 Example: *The pile of papers I left on my desk next to the window are now on the floor. Conclusion: the wind blew them off the desk.*

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2. What is "reason"?
 It is the capacity of **consciously applying logic** by drawing conclusions from new or existing information, with the aim of seeking the truth.

a. Reasoning: The **production of arguments** used in thinking or debate, especially to form conclusions, inferences, or judgments typically based upon evidence.

b. Argument: An argument is made up of **premises and conclusions**. They can be related in order to produce predictable results (**deductive reasoning**) or probabilistic results (**ampliative reasoning**, as with **inductive** or **abductive** reasoning).

c. Critical Thinking: Critical thinking is **the use of reason** and argument when choosing one's beliefs.

d. Evaluating Evidence: Evidence can be evaluated based on its strength of contribution to the premises and conclusions of an argument. **Not all evidence is equal**, based its the logical consistency between the premises and conclusions.

e. Logical Fallacies: Fallacies are errors in logic that are often difficult to detect. [Click for 15 classic logical fallacies.](#)

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3. What is NOT science?

a. Non-science: events or phenomena that simply **do not meet the NOTTUS criteria** and therefore fall outside of the realm of science. This includes any belief system (ideology or religion), philosophy, personal opinions and attitudes, and ethics. *But isn't science just another faith? NO!*

b. Protoscience: science that is emerging or nearing fulfillment of the categories of NOTTUS; with more time, and better tools, new discoveries emerge. For example, research on patterns of electricity in our earth's climate system, [mental telepathy](#) or the [search for aliens \(SETI\)](#).



c. Pseudoscience: "Pseudo-" means false in Latin and so these are claims that appear to be scientific, but the claims do not meet the strict standards of NOTTUS; for example, [astrology](#) or [scientology](#).

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4. On Testing and Evidence: In science, what is crucial in establishing a truth claim are the **types of evidence** one has to back up that claim. **But not all types of evidence are equally strong.**

Weak

a. Anecdotal and even an expert's evidence – stories from lay people or individual experts – sometimes the *weakest* evidence).



b. Experimental evidence – not widely used in sociology, because it puts people in "unnatural" situations, but provides *greater strength*).

Evaluates **Independent versus Dependent variables** (cause) (effect) *(do laptops lead to higher grades?)*

Strong

c. Surveys and Questionnaires – very widely used in sociology; can collect vast amounts of information; typically reliable but not always valid)



d. Case Studies/Observation over time – very widely used in sociology; can be **participant** or **non-participant**; typically valid but not always reliable)



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5. What makes a method valuable?

a. Reliability means generalizability of research or the degree to which the research gives the same results when repeated in different settings.

It is achieved through *large quantity* of results.
(Ex: *surveys and questionnaires* – lots of people can fill them out, but the questions are limited. *Quantitative research* methods often achieve good reliability of results.)

b. Validity means accuracy of research

or the degree to which the study measures **exactly** the reality it claims to be measuring.

It is a measure of the *quality* of results.
(Ex: *case studies and ethnographies* really get into the details. *Qualitative research* methods achieve good validity of results.)
