**About the reason…**

One of the great attractions of reason as a source of knowledge is that it seems to give us certainty. To take a traditional example:

All human beings are mortal,

Socrates is a human being,

Therefore, Socrates is mortal.

Conclusion is necessary and is not a matter of personal opinion or the culture in which you were brought up.

**Rationalism** is a school of philosophy according to which reason is the most important source of knowledge. They are suspicious of knowledge based on perception on the grounds that our senses can all too easily mislead us. Rene Descartes (1596-1650) is one of the most famous rationalists in history. He tried to build a system of philosophy on his famous starting point “I think therefore I am.”(“Cogito ergo sum”)

(Empiricism is opposing theory which claims that all knowledge must ultimately be based on experience (sense experience))

There are three kinds of reasoning:

1. Deductive reasoning
2. Inductive reasoning
3. Informal reasoning

**Deductive reasoning:**

Deductive reasoning is any form of reasoning that moves from the general to the particular. For example:

All dogs are mammals.

Jackie is a dog.

Therefore Jackie is a mammal.

In reasoning (deductive or inductive) we start from the assumptions which in logic are called **premises**. The conclusion must follow from premises.

The above kind of deductive argument is known as a **syllogism**. A syllogism consists of the following items:

1. Two premises and a conclusion
2. Three terms, each of which occurs twice (dogs, mammals, Jackie)

We need to make a distinction between truth and validity. Truth is concerned with what is the case, validity with whether conclusions follow from premises. Truth is a property of statements, validity of arguments. You should not say that an argument is true or false, but rather that it is valid or invalid. We can say that an argument is valid if the conclusion follows logically from the premises. And it is invalid if the conclusion does not follow from the premises. **The validity of an argument is independent of the truth or falsity of the premises it contains.**

For example:

All panthers are pink

Che Guevara is a panther

Therefore Che Guevara is pink.

Both the premises and the conclusion of this argument are false but the argument itself is valid.

Example with false premises and true conclusion:

All bananas are teachers

Nena is a banana

Therefore Nena is a teacher.

We can construct valid arguments for almost any combinations of true and false premises and conclusions. **The only situation that is impossible is a valid argument with true premises and false conclusion.**

If we have following argument structure:

All A are B

Some A are C

Therefore some B are C.

we can substitute anything we like for A, B and C and the argument will always be valid.

We can use a Venn diagram to decide whether or not a syllogism is valid.

C

A

B

**Just because an argument is valid, it does not follow that the conclusion is true.** To be sure that the conclusion of an argument is true you must be able to answer ‘Yes’ to both of the following questions:

1) Are the premises true?

2) Is the argument valid?

Deductive reasoning is an instrument for the preservation of truth but this does not mean that it is a source of truth.

But, if you go back to the syllogism about Socrates, the conclusion that Socrates is mortal is true only if the premises are true. But how do you know that the premises are true? Your knowledge that all human beings are mortal cannot be conjured out of logic, but is based on experience. (Inductive reasoning)

How sure are you that someday you will die? What evidence do you have for your belief?

**Inductive reasoning**

Definition: reasoning from particular to general.

In the example given above we move from ‘All observed human beings are mortal’ to ‘All human beings are mortal’. Since inductive reasoning moves from the observed to the unobserved, it enables us to make generalizations about the world, and we are constantly using such reasoning in everyday life. For example, since my neighbor’s dog has been friendly to me in the past, I am confident that he will not bite me today.

Whole of language is based on inductive generalizations when we put labels such as dog or table or teacher on things we are organizing them into general classes so that we can make predictions about them.

Example:

 A, B, C and D are Serbs and they like Rakia

 Therefore all Serbs like Rakia

Value: more informative, but less certain than deduction.

In practice deduction turns out to be no more certain than induction. This is because the premises on which deductive reasoning about the world is based must be derived from induction.

What distinguishes good generalization?

Since generalization sometimes led us into trouble we need to think about how to distinguish good ones from bad ones. Here are some relevant general criteria:

1. *Number* You should look at a reasonable number of instances. If you see one example of a dog swimming, this is clearly not enough to conclude that ‘all dogs can swim’ and you should look at a lot more cases.
2. *Variety* You should look at a variety of different situations (cases). You might look at different breeds of dogs, young, old dogs, etc.
3. *Exceptions* You should actively look for counter examples. You might ask if anyone has a dog that cannot swim.
4. *Coherence* You should demand more evidence to support surprising claims then unsurprising ones.
5. *Subject area*  You should be aware of the subject area you are dealing with, and keep in mind that generalizations tend to be more reliable in the natural sciences than in the social sciences.

**Informal reasoning**

Besides inductive and deductive reasoning, there is also informal reasoning. We always use informal reasoning in arguments and discussions. Informal reasoning is not reliable as inductive and deductive reasoning, as it may be full of fallacies. There are ten deadly fallacies: *ad ignorantiam*, hasty generalization, *post hoc ergo propter hoc*, *ad hominem*, circular reasoning, special pleading, equivocation, false analogy, false dilemma, loaded question.

**Argument *Ad ignorantiam*** – Claiming something is true because it cannot be proved to be false. “There is an infinity of possible things that one might believe – unicorns, fairies, millions of things – and just because you can’t disprove them it doesn’t mean there is anything plausible about them.” (Richard Dawkins, biologist)

**Hasty generalization** – Generalizing from insufficient evidence.

***Post hoc ergo propter hoc*** – This fallacy means “after this therefore on account of this”. It consists of assuming that because one thing, B, follows another thing, A, than A must be cause of B. Even when one event, A, is regularly followed by another event, B, it still does not necessary mean that A is a cause of B. For example: night is regularly followed by day, but night is not a cause of day.

***Ad hominem*** – This fallacy literary means “against the man”. Attacking or supporting the person rather than the argument. For example: if you make an argument for world government, and are told that you are too young and idealistic to know what you are talking about, that is *ad hominem*.

**Circular reasoning** – Also known as ‘vicious circle’ and ‘begging the question’. It consists in assuming the truth of something that you are supposed to be proving. For example: “I know that Jesus was the Son of God because he said he was, and the Son of God would not lie”.

**Special pleading** – Using double standards to excuse an individual or group. For example: If your neighbor says ‘I know there is a drought and we need to save water, but I am putting my prize flowers in the competition next week and I need to give them plenty of water’.

**Equivocation** – Using language ambiguously. For example consider the following syllogism:

 A hamburger is better than nothing

 Nothing is better than good health

 Therefore, a hamburger is better than good health.

The problem lies with the word ‘nothing’ because it has a different meaning in each of the premises.

**False analogy** – Assuming that because two things are alike in some respects they are alike in other respects.

**False dilemma** – Assuming that only two black and white alternatives exist. For example: If someone says ‘do those who advocate an increase in military expenditure really want to see our schools and hospitals close?’ They are implying that we have only two choices: either we increase military expenditure or we keep our schools and hospitals open.

**Loaded question** – A question that is biased because it contains a built-in assumption. For example, if someone says ‘do you always cheat in exams?’ than if you answer ‘yes’, you are admitting that you always cheat, and if you answer ‘no’ you are implying that you sometimes cheat. What you have to do is challenge the assumption built into the question and say ‘I never cheat in exams’.

Is the statement ‘The TOK teacher was not drunk today’ loaded question?

**Causes of bad reasoning**

There are four main reasons for bad reasoning: ignorance, laziness, pride and prejudice.

**Ignorance:** in some cases, we do not realize that a particular form of reasoning is fallacious, and are taken in by it.

**Laziness**: sometimes we have developed fixed habits of thinking and are too lazy to check the argument or see if it has supporting evidence. Perhaps it is psychologically easier to hold simple beliefs with confidence than get bogged-down with confusing details.

**Pride:** for although we all like to think we are open-minded, once we get involved in an argument we can become more interested in winning than in establishing the truth. Unfortunately logic, the art of reasoning, can all to easily give way to rhetoric, the art of persuasion. And we may then be tempted to resort to any argument – valid or invalid – to defend our position.

**Prejudice**: on some occasions, we may simply begin with our prejudices, and then manufacture bad reasons in order to justify them. This is known as rationalization.

**Reason and certainty**

We have considered three different kinds of reasoning: deductive, inductive and informal reasoning. The fact that fallacies can arise with each of these suggests that we cannot always rely on reason to give us knowledge.

We might, however, say that, as a way of thinking, logical reasoning cannot really be doubted. Such reasoning is based on the following three laws of thought.

1. *The law of identity*. If A, then A. For example, ‘If something is a banana, then it is a banana.’
2. *The law of non-contradiction*. Nothing can be both A and not-A. For example, ‘Nothing can be both a banana and not-a-banana.’
3. *The law of the excluded middle*. Everything is either A or not A. For example, ‘Everything is either a banana or not a banana.’ (There is nothing left in the middle hovering uncertainly between being and not being a banana. A banana with an identity crisis, perhaps?(-:

The logical reasoning represents the basis of every communication, so we can say that communication is based on logic. Logical reasoning is not perfect but still as one famous philosopher said: you cannot think analogically.

We need reason to develop consistent believes about the world, but we can sometimes become trapped in the “prison of logic” and this can stifle our creativity. Furthermore, reason is not appropriate in every situation, and if someone is too rational they may simple come across as a cold and unfeeling automaton. In private life, for example the best way to resolve a dispute with loved one may not be by proving their inconsistency to them but by showing them empathy and understanding. In other words, reason need to be balanced by emotion.