

Response to reading on reason

Truth and validity

The difference between truth and validity:

Truth is concerned with what is the case; a property statements

Validity with whether conclusions follow from premises; a property of arguments

—> an argument can not be true or false, can only be valid or invalid.

* the validity of an argument is independent of the truth or falsity of the premises it contains

After reading this, I started to think about our own knowledge and its basis. What if some of our premises are false? Does that mean that our whole knowledge system is false?

On the other hand, however, we need to have at least something to be based on in order to know what we know. And since there is no universal truth, (and we can't say the statement is true that there is no universal truth, because otherwise there will be a truth, which is, there is no universal truth, which is a paradox) we can deduce that all our knowledge is unfounded.

It should be like that because all subjects we are learning are all human's efforts to understand the universe; this is very likely, not how the universe really works. But, as my physics teachers always respond when I doubt the truth of the formulas, "if it works, we accept it." It is not that we are too sketchy and lazy to know the truth, but that we never could, however we might try.

The structure of arguments

Belief bias

The tendency we have to believe that an argument is valid simply because we agree with the conclusion.

Venn diagrams

This very much reminds me about Math! Mathematics is all about reasoning! And it is also its rigor that makes me love it so much!

Deductive reasoning preserves truth

To say an argument is true:

1. The premises are true
2. The argument is valid.

* Logical reasoning is a technique for preserving truth.

Enthymeme

An incomplete argument in which one of the premises is assumed but not stated.

Inductive reasoning

Induction

From the particular to the general

This also reminds me of math. In math, we have a useful proof technique called mathematical induction, which is also going from the particular to the general. But what is different fundamentally is that even though it is going from the base case to the general, it is still a valid statement we get in the end, because we prove that $n-1$ th case always leads to the n th case. It is interesting how different subjects define induction in fundamentally different ways.

Deduction and induction compared

In practice, however, 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.

Fallacies

Reason and certainty

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

Law of thoughts:

The fundamental assumptions on which logic is based

1. The law of identity
2. The law of non-contradiction

3. The law of the excluded middle

All proofs must end somewhere.

All things must start somewhere. In math, Euclidean geometry is completely based on the five (or four, someone may argue) axioms that Euclid mentioned in his Elements.

Can deductive reasoning be doubted?