



Critical Reasoning for Beginners

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Recap on last week: arguments are...

...sets of sentences such that...

.... one of them (the conclusion) is being said to be true...

.... the other(s) (the premises) are being offered as reasons for believing the truth of the one

Distinguish arguments from:

(a)sets of sentences not related as arguments

(b)sentences (assertions)

**Today we shall be considering
different types of argument**

There are two basic types of argument:

(i) deductive arguments

(ii) inductive arguments

**Deductive arguments are such
that...**

**... the truth of their premises
*guarantees...***

...the truth of their conclusion

Example of a deductive argument:

It is Friday

Marianne always wears jeans on a Friday,

Therefore Marianne is wearing jeans.

Deduction is an 'either/or' thing:

**a good deductive argument gives
us conditional certainty**

a bad one tells us nothing

Inductive arguments are such that...

... the truth of their premises...

**... makes the conclusion more or
less probable**

Note:

Inductive arguments can be either weak or strong

Example of a strong inductive argument:

The sun has risen every day in the history of the universe

Therefore the sun will rise tomorrow

**Example of a weak inductive
argument:**

**Every time I have seen Marianne
she has been wearing earrings**

**Therefore next time I see
Marianne she will be wearing
earrings**

Can you say which arguments are deductive and which inductive:

- 1. The sun is coming out so the rain should stop soon.**
- 2. If Jane is at the party John won't be. Jane is at the party, therefore John won't be.**
- 3. The house is a mess therefore Lucy must be home**
- 4. Either he's in the bathroom or the bedroom. He's not in the bathroom, so he must be in the bedroom.**
- 5. The dog would have barked if it saw a stranger. It didn't bark, so it didn't see a stranger.**
- 6. No-one in Paris understands me, so my French must be rotten, or the Parisians are stupid.**

Logicians study deduction by studying valid arguments forms....

...arguments that are valid in virtue of their *forms* as opposed to their contents.

All men are mortal

Socrates is a man

Socrates is mortal

**All actions that
produce the GHGN are
right.**

**That action produced
the GHGN.**

That action was right

Modus ponens:

If P then Q, P therefore Q

Example:

**If there are no chance factors in chess
then chess is a game of skill.**

There are no chance factors in chess.

Therefore chess is a game of skill.

Modus tollens:

If P then Q, not-Q therefore not-P

Example:

**If the dog did not know the visitor well
the dog would have barked.**

The dog did not bark.

**Therefore the dog did not know the
visitor well.**

Disjunctive syllogism:

P or Q, not-P therefore Q

Example:

Either we hope for progress through improving morals or we hope for progress from improving intelligence.

We can't hope for progress through improving morals.

Therefore we must hope for progress through improving intelligence.

Leibniz's Law:

a is F, a=b, therefore b is F

Example:

Jane is tall.

Jane is the bank manager.

Therefore the bank manager is tall.

Syllogism:

all Fs are G, a is an F, therefore a is a G

Example:

All men are mortal.

Socrates is a man.

Therefore Socrates is mortal.

Note: some arguments are deductively valid
but in virtue of their content NOT their form

Deontic logic:

Lying is wrong.

Therefore we shouldn't lie.

Modal logic:

**It is necessarily the case that
there are no square circles.**

**Therefore it is not possible that
there are square circles.**

Temporal Logic:

It is raining today.

**Therefore tomorrow it will have been
raining yesterday.**

All inductive arguments rely on the assumption of the uniformity of nature....

...the idea that the future will be like the past

Can you see why these rely on the principle of the uniformity of nature?

Every day in the history of the universe the sun has risen.

Therefore the sun will rise today

Every time I have seen Marianne she has been wearing earrings

Therefore Marianne will be wearing earrings when I see her today

Within the category of inductive argument there are many different sub-types:

Arguments from analogy:

A is like b, A is F, therefore b is F

Example:

The universe is like a pocket watch

A pocket watch has a designer

Therefore the universe has a designer

Arguments from authority:

Example:

Einstein is a brilliant physicist

Einstein says relativism is true

Therefore relativism is true

Causal arguments:

**Every time an A occurs a B occurs,
therefore As cause Bs**

Note:

**causal arguments can be deductive
or inductive...**

**... depending on whether we are
arguing *from* a causal claim...**

... or *to* a causal claim

As cause Bs

There was an A

Therefore there will
have been a B

Every observed A has
been followed by a B

Therefore As cause Bs

Your task for the week ahead:

See if you can find (in your newspaper, magazine or book) four arguments that fit the patterns we have discussed today.

Next week we will look at identifying arguments and setting them out 'logic book style'