Critical Reasoning for Beginners: Four

Marianne Talbot

Department for Continuing Education

University of Oxford

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Last week we learned how to analyse arguments…

… and set them out logic-book style

Six steps to analysing an argument:

1. identify the conclusion;
2. identify the premises;
3. add suppressed premises
4. remove irrelevancies;
5. remove inconsistent terms;
6. remove cross-references.

We saw that, although we need to paraphrase arguments in order to complete these steps…

…we should not change the meaning of any of the premises or the conclusion

We also saw that although it is necessary to bring to bear our understanding of the argument…

…..it is important not to read into the argument anything that isn't there…

..at least implicitly

It is extremely important, in analysing an argument, not to *evaluate* the argument…

…that comes later….

….first we identify the argument *then* we evaluate it.

This week we shall be starting to learn how to evaluate arguments…

…I was going to start with deduction and so with validity and truth…

…but I have decided to start with induction instead

Inductive arguments are such that…

…the truth of their premises…

… makes the truth of their conclusion…

…more or less likely

All inductive arguments rely on the principle of the uniformity of nature….

…and the only arguments for the principle of the uniformity of nature are themselves inductive

Types of inductive argument:

- inductive generalisations;
- causal generalisations;
- arguments from analogy;
- arguments from authority.

Inductive generalisations:

The premise identifies a characteristic of a sample of a population….

…the conclusion extrapolates that characteristic to the rest of the population.

60% of the voters sampled said they would vote for Mr. Many-Promise.

Whenever I have tried to ring BT it has taken me hours to get through.

Therefore Mr. Many-Promise is likely to win.

Therefore when I ring BT today it will take hours to get through.

Exercise: which questions would you need to have answered in order to know whether or not these are good arguments?

60% of the voters sampled said they would vote for Mr. Many-Promise.

Therefore Mr. Many-Promise is likely to win.

Whenever I have tried to ring BT it has taken hours.

Therefore today when I ring BT it will take hours.

Is the premise true?

Can we really believe whoever claimed this:

Might they be bad at record-keeping? Engaged in wishful thinking? Bad at maths?

Am I telling the truth when I say this?

Am I in the pay of one of BT's rivals? Am I prone to exaggeration? Am I bad at estimating time?

How large is the sample?

How many of those who would vote in the election were sampled?

10 out of 1 million?

1000 out of 1 million?

How often have I rung BT in the past?

Once?

About 50 times

How representative is the sample?

Were the voters sampled all female? Over 40? White? Middle class? Known to the person conducting the survey?

Have I only ever rung BT on a Sunday? After 10pm? When I am in a hurry?

Are there any counterexamples?

Has it ever been the case that 60% of the sample agreed they'd vote for someone and yet didn't?

Have I ever rung BT and succeeded in getting through first time?

Beware 'informal' heuristics

Three of Clubs

Seven of Diamonds

Nine of Diamonds

Queen of Hearts

King of Spades

Ace of Spades

Ace of Hearts

Ace of Clubs

Ace of Diamonds

King of Spades

Beware 'informal' heuristics

In 4 pages of a novel (2000 words) how many words would you expect to find ending in 'ing'?

In four pages of a novel (2000 words) how many words would you expect to find that include the letter 'n'?

Causal generalisations:

The premise identifies a correlation between two types of event….

…the conclusion states that events of the first type cause events of the second type.

Exercise: which questions would you need to have answered in order to know whether or not these are good arguments?

Married men live longer than single men

Therefore being married causes you to live longer

When air is allowed into a wound maggots form

Therefore maggots in wounds are caused by air being allowed into the wound

Is the premise true?

Who says married men live longer?

A married man?

A woman who wants to get married?

Fred, whose parents split up when he was 5?

Who says maggots form when air gets into a wound?

A newly qualified nurse?

An elderly doctor?

A scientific study?

How strong is the correlation?

How many married men were observed?

Over how long?

Were unmarried men observed?

How many cases of maggots forming were observed?

Were wounds into which air was *not* allowed observed?

Does the causal relation make sense or could it be accidental?

Why would being married cause men to live longer?

Why would air getting into a wound cause maggots to form?

What causes what?

Could it be that being long-lived causes marriage in men?

Or could having the genes for longevity cause men to get married?

Er……could maggots forming cause the air to get into a wound?

Or could there be something that causes both air getting into the wound *and* maggots to form?

Arguments from analogy take just one example of something….

…..and extrapolate from a character of that example….

…. to the character of something *similar* to that thing

The universe is like a pocket-watch

Pocket watches have designers

Therefore the universe must have a designer

Evaluating arguments from analogy:

- – are the two things similar?

- – are they similar in respect of something relevant?

- – can we find a disanalogy?

Arguments from authority…

….take one person or group of persons…

…who are, or are assumed to be, right about some things…

….and extrapolate to the claim they are right about other things

Human rights monitoring organisations are experts on whether human rights have been violated.

They say that some prisoners are mistreated in Mexico.

Therefore some prisoners are mistreated in Mexico

Evaluating arguments from authority:

- Who exactly is the source of information?

- Is this source qualified in the appropriate area?

- Is the source impartial in respect of this claim?

- Do other experts make other claims?

Next week we'll look at validity and truth before turning to the evaluation of deductive arguments