



Critical Reasoning: A Romp Through the Foothills of Logic

Lecture Two: Analysing Arguments

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Michaelmas Term 2012**



Last week we looked at:

- **the nature of argument**
- **how to distinguish arguments from other uses of language**
- **basic terminology**
- **why argument is important**

We also briefly considered the nature of truth and reason, and made a start on the analysis of argument



This week we are going to continue learning how to analyse arguments by learning how to:

- **set out arguments logic book style**
- **deal with ambiguities**
- **identify conclusions and premises**
- **eliminate irrelevancies**
- **identify suppressed premises**
- **make terms consistent**



We have successfully analysed an argument when we have revealed its structure by setting it out logic book style



Here, set out logic book style, is an argument we used last week:

Premise One:

**The mail is always late
when it rains**

Premise Two:

It is raining

Conclusion:

The mail will be late



So our aim today is to learn how to analyse arguments and set them out logic book style

But first we are going to look at the phenomenon of ambiguity



A word or phrase is *ambiguous* if it can be understood in different ways.

There are different types of ambiguity



Lexical: a single word can be understood in more than one way (see how many meanings you can think of for the word 'bank'. Do not restrict yourself to nouns).

Structural: the words in a sentence or phrase can be grouped together differently (consider 'the black taxi drivers were on strike' or 'every pretty girl loves a sailor')

Cross Reference: when a word or phrase might refer to more than one thing (consider 'Jaz doesn't want Jane at the party because she doesn't like her').

Pragmatic: when a sentence could be used to do different things (consider the things you might do with the sentence 'I rang the police')



A string of words can also be ambiguous when spoken but not when written (‘This pitcher of water’ or ‘This picture of water’).

We can also create different meanings by intonation:

‘Do swallows fly south for winter?’



Ambiguities are not a good thing when it comes to argument...

...if you find one in an argument you are trying to analyse...

...you should either rewrite the sentence to get rid of it...

...or produce two analyses, one to represent each meaning



**Jaz doesn't want Jane at the party
because she doesn't like her**

- 1. Jaz doesn't want Jane at the party
because Jaz doesn't like Jane**
- 2. Jaz doesn't want Jane at the party
because Jane doesn't like Jaz**



OK having looked at ambiguity we are now going to learn how to reveal the structure of arguments



In order to reveal the structure of an argument we must learn how to

- **identify its conclusion**
 - **identify its premises**
 - **eliminate irrelevancies**
 - **reveal controversial suppressed premises**
 - **make language consistent**
- 



The conclusion of an argument is the sentence that is being asserted on the basis of the other sentence(s)



**Be aware that it is not always at the
end of the argument**



Where is the conclusion of this argument?

Marianne is wearing jeans because it is Friday and Marianne always wears jeans on Friday



Where is the conclusion of this argument?

***It is Friday so Marianne is wearing jeans
because Marianne always wears jeans on
Friday***



It is sometimes possible to identify a conclusion because it is indicated by a word like 'so', 'therefore', 'hence', 'consequently' or some other conclusion indicator

Exercise One: Which of the following arguments have conclusions indicated by 'conclusion-indicators'.

- 1. The kettle whistles only when it is boiling. The kettle is whistling. Therefore the kettle is boiling.**
- 2. Jane will be at the party. After all Jane goes to every party John is at, and John will be at the party.**
- 3. The numbers of seconds between a clap of thunder and a flash of lightening is correlated with how far away the storm is. There were 5 seconds between that clap of thunder and that flash of lightening. So this storm is 5 miles away.**
- 4. Marianne always wears jeans on a Friday. Marianne belongs to a strange sect that believes that on Fridays, it is wrong to wear anything but jeans. Marianne always follows the precepts of this sect.**



But the only foolproof way of identifying a conclusion is by its *role* in the argument...

...the fact that it is the sentence being asserted on the basis of the other sentence(s)



Sometimes the best way to determine which sentence is the conclusion of an argument is by reading the argument out loud – with feeling!

Exercise Two: Can you identify the conclusions of these arguments:

- 1. Help is needed urgently, in view of the fact that two hundred people are dying daily.**
- 2. When communists operate as a minority group within a union, settlements by the established officials must be denounced as sellouts. It follows that strikes are unlikely to wither away in any democratic country so long as Communists have strong minority influence.**
- 3. The nests of verdin are surprisingly conspicuous, for they are usually placed at or near the end of a low branch.**
- 4. The effect of ACTH on gout is not due to the increased renal acid clearance alone, since the effect of salicylates on this clearance is greater.**
- 5. Some contribution to the magnetic field comes from electric currents in the upper atmosphere; otherwise we cannot account for the relation between the variations in the magnetic elements and the radiation received from the sun.**

This exercise comes from Wilfred Hodges: Logic (Pelican Original, 2nd edition, 2001), page 38



Here are the five things you need to know to identify conclusions:

- **the definition of ‘conclusion’;**
- **that a sentence is a conclusion only because of the role it is playing in an argument (that the very same sentence may, in a different argument, be a premise);**
- **that a conclusion may be found anywhere in an argument, it needn’t be at the end;**
- **that conclusions are sometimes, though not always, indicated by a ‘conclusion indicator’ such as ‘so’ or ‘therefore’**
- **that sometimes reading aloud the argument will help you identify the conclusion.**



Now let's look at identifying premises...

...the premises of an argument are those sentences...

... offered as *reasons* for believing the conclusion



A sentence that is a conclusion in one argument might, of course, be a premise in another argument...

...what is important is again the role being played by the sentences that constitute an argument



Premises, like conclusions, are sometimes indicated by 'premise-indicators' such as 'because' or 'as' or 'for' ...

...but again the only foolproof way of identifying a premise is by the role it plays in the argument



**When an argument contains two sentences
conjoined by 'and'...**

**...you should consider whether to represent them
as one complex sentence (the whole
conjunction)...**

**...or whether to represent them as two
separate sentences (leaving out the 'and')**



You should split up a conjunction whenever both sentences are needed for the conclusion to follow



So in the argument:

‘It is Friday today and Marianne always wears jeans on Fridays, so Marianne is wearing jeans today’

it is best to split up the conjunction



This reveals the argument:

Premise One: *It is Friday today*

Premise Two: *Marianne always wears jeans on Fridays*

Conclusion: *Marianne is wearing jeans today*

better than this does:

Premise One: *It is Friday today and Marianne always wears jeans on a Friday*

Conclusion: *Marianne is wearing jeans today*

and notice the meaning doesn't change



But beware:

- **not all 'and's conjoin sentences**
- **sometimes 'and' is used restrictively (to indicate the individual under discussion)**

Exercise Three: Which of these sentences can be represented as a simple conjunction?

- 1. Claude is a black and white cat**
- 2. Charles is a stupid boy**
- 3. The clever twin was always teasing her dim-witted sister**
- 4. The policeman, who was watching through binoculars, ducked just in time**
- 5. The policeman who was watching through binoculars ducked just in time**

Some of these questions were adapted from Wilfred Hodges: Logic (Pelican Original, 2nd edition, 2001), pages 72-81



You should also note that not all conjunctions use the word 'and':

- **Although it was snowing she went out with wet hair**
- **He was rich but nice**
- **It was comfortable if a little cold**



There are two major problems to be aware of when identifying premises.

- 1. the person offering the argument may have uttered sentences, words or phrases irrelevant to the argument**
- 2. the person offering the argument may *not* have uttered sentences that seem required for the argument**

Let' s look at these in turn.





Irrelevancies are ubiquitous in everyday arguments. Consider:

‘The post is going to be late *again!* I’m fed up. It’s pouring, and the mail is *always* late when it’s raining because the postman doesn’t like getting wet.’



‘The post is going to be late *again!* I’ m fed up. It’ s pouring, and the mail is *always* late when it’ s raining because the postman doesn’ t like getting wet.’

Can you identify:

- 1. the premises and conclusion of this argument?**
- 2. some ‘irrelevancies’**

'The post is going to be late *again*! I'm fed up. It's pouring, and the mail is *always* late when it's raining because the postman doesn't like getting wet.'

The argument is:

Premise One:

It's pouring

Premise Two:

The mail is always late when it's raining

Conclusion:

The post is going to be late

Irrelevancies are: '*I'm fed up*', the '*again*' in the conclusion' and '*because the postman doesn't like getting wet*'



When human beings argue their arguments are often accompanied by expressions of emotion, or explanations of beliefs, which are unnecessary to the argument.



When you are analysing arguments do not hesitate to eliminate irrelevancies (but make sure they *are* irrelevancies (i.e. that they play no part in the argument!))



You might also find, when you are analysing an argument, that you think some premises are missing



An argument with a suppressed premise is called an *enthymeme*...

...enthymemes are extremely common...

**...it would be boring beyond belief if
everyone explicated every
presupposition and common belief that
underpins their thinking**



For example if Priya tells Sarah that...

... she is taking her umbrella because she thinks it is raining...

...there is no need for her to add...

...‘and my umbrella will stop me from getting wet’...

...because she can assume that anyone she is talking to would know this



With enthymemes the crucial thing is...

... to distinguish between benign premise-suppression...

... and the suppression of a premise because it is controversial...

... and would weaken the argument.





Here is an enthymeme in which a controversial premise is suppressed:

In human therapeutic cloning the embryo is always killed, so human therapeutic cloning is wrong because it is wrong to kill innocent persons

Can you identify the controversial premise?



Exercise Four: Is there a controversial suppressed premise in these arguments:

- 1. Female circumcision should be permitted in Somalia because it is an integral part of Somali culture.**
- 2. Jem is male so he can't be Sam's wife.**
- 3. The car has stopped, I knew I should have got petrol before I left.**
- 4. We can never be sure that someone is guilty, therefore the death penalty should be abolished**



Here are 7 things you need to know to identify the premises of an argument:

- 1. the definition of 'premise';**
- 2. that a sentence is a premise only because of the role it is playing in an argument;**
- 3. premises are sometimes, though not always, indicated by a 'premise indicator' such as 'because' or 'implies'**
- 4. that sometimes reading aloud an argument will help you identify the premises;**
- 5. that sometimes an argument includes a sentence (word or phrase) that is irrelevant to the argument;**
- 6. that sometimes one (or more) premises is suppressed;**
- 7. that a suppressed premise can be benign or not.**



**Finally let's look at making the language of
an argument consistent**



Here is an argument we used earlier, can you see how we might make some of the terms in this argument more consistent:

Premise One:

It's pouring

Premise Two:

**The mail is always late
when it's raining**

Conclusion:

The post is going to be late



Here are some terms such that there is no obvious difference between their meaning:

Premise One: **It's pouring**

Premise Two: **The mail is always late
when it's raining**

Conclusion: **The post is going to be late**

If we choose one of these terms and substitute it for the other it will make the structure of the argument clear without changing anything important to the argument.



Isn't the structure of the argument clearer when I do this:

Premise One: It's raining

**Premise Two: The mail is always late
when it's raining**

Conclusion: The post is going to be late

All I have done is substitute 'it's raining' for 'it's pouring'

Can you see another substitution I might make?



Isn't this even clearer?

Premise One:

It's raining

Premise Two:

**The post is always late
when it's raining**

Conclusion:

The post is going to be late



**By making the language used in an argument
consistent...**

**... you are revealing the *structure* of the
argument more clearly...**

**...and as we have seen this matters
enormously when engaging in critical
reasoning**



Finally you might like to try this exercise at home:

Exercise Five: analyse the following argument, eliminating irrelevancies, explicating suppressed premises (if there are any that should be explicated), making terms consistent and setting it out logic book style:

I'm not being cruel when I pull my cat's tail. After all I am only being cruel if I inflict pain, and of course, God would not allow the innocent to suffer. And my cat, not being a moral agent in the first place (since she's an animal and animals aren't moral agents) cannot be said to have sinned

This argument comes from the Oxford University Preliminary Exam of 1997



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To go with this lecture series, which I gave at the Department For Continuing Education, The University of Oxford (OUDCE) in Michaelmas Term 2012, there is an e-book and a short (ten week) online course run by OUDCE.

Both are entitled: **Critical Reasoning: A Romp Through the Foothills of Logic**

- The book, by Marianne Talbot will soon be available from all good e-book providers (follow me on Twitter @oxphil_marianne to find out when it will be released)
- Further details of the course can be accessed here:
http://www.conted.ox.ac.uk/courses/online/short/subject.php?course_subject=Philosophy

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October 2013



So that's it folks...

**...next week we'll be distinguishing
deduction and induction**