Critical Reasoning:
A Romp Through the Foothills of Logic

Lecture One: The Nature of Arguments

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In our six lectures we shall be covering:

- **the nature of argument**
- **analysing arguments**
- **deduction and induction**
- **deductive validity**
- **inductive strength**
- **common fallacies**

Please note that I have reversed lectures two and three from the leaflet

In today's session we shall:

- **look at the nature of argument**
- **learn to distinguish arguments from other uses of language**
- **learn some basic terminology**
- **start on the analysis of arguments**
- **consider why argument is important**
- **briefly consider the nature of truth and reason**

Let's start by looking at a clip of the Monty Python's famous 'Argument Clinic':

http://video.google.com/videoplay?docid=-5720779071959699 15#

As you watch keep an eye out for two different definitions of 'argument'

M says:

"if I argue with you I must take up a contrary position"

A says:

"an argument is a connected series of statements to establish a definite proposition"

Both M and A are right to define 'argument' as they do…

…which tells us that the word 'argument' in English is ambiguous…

…it has more than one meaning

We won't use quite the definitions used in the 'Argument Clinic'…

…but our definitions will be similar

1. **Def_1: An $argument_1$ occurs whenever two people disagree and each tries to persuade the other of their case.**

2. **Def_2: An $argument_2$ consists in a set of sentences such that one of them is being asserted on the basis of the other(s).**

The two definitions capture the difference between…

… arguing *with* someone (argument$_1$)…

….and arguing *for* something (argument$_2$)

In learning Critical Reasoning our interest is mainly in argument$_2$

This is because to argue well *with* someone it is necessary to argue well *for* something

So our definition of 'argument' is:

a set of sentences such that one of them is being asserted on the basis of the other(s)

Critical Reasoning: A Romp Through the Foothills of Logic for Complete Beginners, by Marianne Talbot (soon available from all good e-book providers!)

The first thing we need to know is what counts as *a sentence that is being asserted*

Humans beings can do many different things with the sentences of their language…

…they can ask questions, issue warnings, provide reassurance, issue commands…

…we signal which of these things we are doing in all sorts of ways…

…but a standard way is by the *force* or *mode* of our utterance

If we *assert* a sentence (utter the sentence in assertoric mode)…

…then (if we are sincere) we are expressing a belief…

…by uttering a proposition we believe to be true…

…and the sentence we assert will be a *declarative* sentence

These sentences are all in assertoric mode, they are all *declarative* sentences:

- **'The chair is blue.'**
- **'I am happy.'**
- **'Nothing travels faster than the speed of light in a vacuum.'**

As used here the sentences are merely being *mentioned* but if I were to *use* them (sincerely) I would be expressing a belief

The test for whether a sentence is declarative or not is if it makes a grammatical question when substituted for 'x' in this 'frame':

'Is it true that x?'

Which of these sentences is declarative?

1. **The retail price index has fallen.**
2. **We need tomatoes**
3. **Are you ill?**
4. **I hereby resign from the committee**
5. **When did you see Jaz?**
6. **Close the door!**
7. **Don’t worry**

The second thing we need to understand is that an argument is constituted of a *set of sentences* not a single sentence

Have a look at this argument$_1$ and tell me what you think of it…

Jim: Nothing travels faster than light in a vacuum.

Lin: But that may not be true, I have heard that neutrinos travel faster than light in a vacuum.

Jim: Nothing travels faster than light in a vacuum.

Lin: But what about that experiment that they did in Cern? Didn't that show that this might not be true even though it is part of Einstein's Theory of Special Relativity, and physicists have believed it to be true for over 100 years?

Jim: Nothing travels faster than light in a vacuum.

Lin: So you keep saying. But have you heard of the experiment or not? I agree that the chances are high that something was wrong with the experiment, but didn't the people announcing the experiment say that they wouldn't be announcing it if they hadn't checked for errors and found none?

Jim: Nothing travels faster than light in a vacuum.

Jim isn't arguing$_1$ well because he is merely asserting the same sentence over and over…

…the fact he is (probably) right is irrelevant…

…he is never going to persuade anyone of anything until he…

…offers *reasons* for the belief he is expressing…

…until he offers an argument$_2$

We argue *only* when…

… we assert a declarative sentence…

…and…

… offer *reasons for believing* that sentence

An argument, therefore, consists in at least *two* sentences…

…a *set* of sentences, one of which is being asserted…

…..on the basis of the other(s)…

…not just one sentence on its own

But here is a complication:

> ***'Marianne always wears jeans on Mondays, and it is Monday today so Marianne will be wearing jeans.'***

This seems to be an argument in *only one sentence…*

…but if so not all arguments are *sets of* sentences

Consideration of this case tells us that we must distinguish between:

simple sentences

and

complex sentences

A *simple* sentence is a sentence the parts of which are all *sub-sentential*

'John loves Mary'

'Mary loves John'

A *complex* sentence is a sentence some parts of which are themselves sentences

'John loves Mary and Mary loves John'

When I said a single sentence is not an argument…

…I meant that a single *simple* sentence …

…is not, and cannot be, an argument

But a single *complex* sentence *might* be an argument…

But it will be an argument *only*…

… if it can be analysed into a set of sentences…

… that are related in the right way

How must the sentences in a set be related to constitute an argument?

To make an argument…

… one sentence in the set must be being asserted…

…on the basis of the other(s)

Here are two complex sentences, let's see if they can be analysed into arguments:

1. **The mail is always late when it rains, and it is raining, so the mail will be late *again.***

2. **If it is summer then the bees will be pollinating the flowers.**

Looking at the first complex sentence we should ask: is there a sentence that is being asserted on the basis of the other(s)?

'The mail is always late when it rains, and it is raining, so the mail will be late *again*.'

‘The mail will be late again’

…is being asserted on the basis of the other sentences that make up this complex sentence

Which sentences are being offered as a basis for this assertion?

‘The mail is always late when it rains, and it is raining, so the mail will be late *again*.’

The sentences being offered as a basis for the assertion are:

‘The mail is always late when it rains’

‘it is raining’

The sentence that is being asserted on the basis of the others is called *the conclusion*

The sentence(s) that are offered as the basis for the assertion are called *the premise(s)*

So we can analyse our first complex sentence as follows:

Premise One:	**The mail is always late when it rains**
Premise Two:	**It is raining**
Conclusion:	**The mail will be late**

We see now that our first complex sentence *can* be analysed into a set of sentences related in the right way to be an argument

The sentences are related as premises to conclusion: the conclusion is being asserted on the basis of the premises

Now let's look at the second complex sentence:

'If it is summer the bees will be pollinating the flowers'

First, is there a sentence that is being asserted on the basis of the other(s)?

'If it is summer the bees will be pollinating the flowers'

You might think that the sentence…

… ‘the bees are pollinating the flowers’ is being asserted …

… on the basis of the sentence ‘it is summer’

But is this correct?

Is a person who utters 'if it is summer the bees are pollinating the flowers'…

…asserting *the bees are pollinating the flowers…*

…on the basis of its being summer?

The answer is ‘no’.

Someone saying ‘If it is summer the bees are pollinating the flowers’ isn’t asserting *either* of the simple sentences that make up this sentence.

They are merely drawing our attention to a *connection* between its being summer and the bees pollinating the flowers

We cannot analyse this sentence into:

Premise One: **It is summer**

Conclusion: **The bees are pollinating the flowers**

because the sentence is a *conditional* ensuring that neither sentence is being asserted

This complex sentence is not analysable into a *set* of sentences that are related in the right way to be an argument

If we analyse it at all we lose its meaning.

We must be careful of the difference between *entailment* (therefore) and *implication* (if/then)

Arguments, then, are sets of sentences, where one of the sentences (the conclusion) is being asserted on the basis of the other(s) (the premises)

Exercise: Which of the following sets of sentences are arguments?

1. **Towards lunchtime clouds formed and the sky blackened. Then the storm broke.**

2. **Since Manchester is north of Oxford and Edinburgh is north of Manchester, Edinburgh is north of Oxford.**

3. **Witches float because witches are made of wood and wood floats.**

4. **Since Jesse James left town, taking his gang with him, things have been a lot quieter**

5. **If it is snowing then it is cold.**

6. **The fox got under the fence and ate the chickens**

7. **If you are cold you should turn the heating up or put a jumper on.**

Nos 1-4 adapted from Robert J. Fogelin, Understanding Arguments: An Introduction to Formal Logic, Harcourt, Brace and Jovanovitch, publ. 1978, page 33.

OK so we now know more about the nature of an argument

But we might want to know why arguments are important.

Arguments are important because when we give reasons for our beliefs…

…the reasons are reasons for *everyone*…

…because they are reasons to believe our conclusion is *true…*

…not just *true for the person arguing* but simply *true*

Jim: Nothing travels faster than light in a vacuum.

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Jim: Nothing travels faster than light in a vacuum.

Sometimes people get confused about the idea that truth is truth for everyone…

…so let's do a little thought experiment

‘Fred believes that Marianne is wearing jeans’

‘Fred believes Marianne is wearing jeans’

Fred believes Marianne is wearing jeans

1. Could the embedding sentence be true whilst the embedded sentence is false?

2. Could the embedding sentence be true at the same time as the embedded sentence?

3. Could the embedded sentence be true whilst the embedding sentence is false?

4. Could the embedded sentence be true whilst the embedding sentence is also true?

The truth values of the embedded sentence and the embedding sentence…

… vary quite independently…

…but that this is the case can be obscured by a common logical blunder

If we say:

'Marianne is wearing jeans is true for Fred'

we might mean either:

1. **Fred believes Marianne is wearing jeans**

2. **'Marianne is wearing jeans' is true for Fred (though not for anyone else)**

The first meaning…

… ‘Fred believes that Marianne is wearing jeans’…

…is perfectly innocuous

The second meaning…

… ‘’Marianne is wearing jeans’ is true for Fred (but not for anyone else)’…

…is weird!

Surely there are only two possibilities:

Possibility one: Marianne *is* wearing jeans

…in which case 'Marianne is wearing jeans' is true for *everyone* not just Fred

(the embedded sentence is true and so is the embedding one).

Possibility Two: Marianne is *not* wearing jeans

…in which case 'Marianne is wearing jeans' is not true for *anyone* not even Fred

(and even if Fred does believe it is true. So the embedded sentence is false even though the embedding sentence is true.)

Don't be dazzled by the fact that Fred's believing something means that that belief is true for Fred (i.e. Fred *believes* it to be true)

…and fail to see that *the something that Fred believes to be true* may, in fact, be *false.*

It is vital to distinguish *someone's believing something* from the *something that they believe*

So today we have learned that:

- **arguments are sets of sentences one of which (the conclusion) is being asserted on the basis of the other(s) (the premises)**
- **a sentence is being asserted when it is a declarative sentence uttered (sincerely) in declarative mode**
- **a declarative sentence is one that makes a grammatical question when substituted for 'X' in 'Is it true that X?'**
- **we must distinguish simple sentences (all the parts of which are sub-sentential) from complex sentences**
- **we must distinguish 'therefore' (entailment) and 'if' (implication)**
- **argument is important because the reasons we give for our beliefs are reasons to believe the belief asserted is true *for everyone***

Well, that's it for today…

…next week we'll be learning to analyse arguments

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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