

Reason and Argument

Lecture 2:

Arguments and Validity

Arguments

In an argument, a number of starting claims (premisses) are put forward as, or considered as, supporting a conclusion.

Example:

There will be talks, or a widespread conflict will break out.

There will not be talks.

A widespread conflict will break out.

Definitions

A **STATEMENT** (I sometimes use '**CLAIM**') is an indicative sentence used to say something true or false.

An **ARGUMENT** is a set of statements divided into premisses (starting claims) and a conclusion.

There may be any number of premisses (0 – infinity) but only **ONE** conclusion.

In an argument it is meant to be the case that the premisses *support* the conclusion (Lepore says “the conclusion purportedly follows from the premisses”)

“Support”

A broad account of “support”:-

The premisses of an argument support its conclusion if:

If one believes the premisses, that gives one reason to believe the conclusion.

If one thinks the premisses *true*, that gives one reason to think the conclusion *true*.

A Sharpening of Focus

We will be concerned primarily with the *strongest* form of support of this kind. That which occurs in arguments which are such that:—

If the premisses are true, then the conclusion *must* be true also.

The truth of the premisses would *force* or *necessitate* the truth of the conclusion.

Key Concept: **(Deductive) Validity**

Sketch of validity:

A **DEDUCTIVELY VALID ARGUMENT** is an argument such that *if* its premisses are true then its conclusion *must* be true also.

Validity (the official definition):

A **DEDUCTIVELY VALID ARGUMENT** is an argument such that it is *not* possible for it to be the case *both* that its premisses are true *and* that its conclusion is false.

Deductive Invalidity

An argument is **DEDUCTIVELY IINVALID** if it could be that its premisses were all true and its conclusion false; otherwise, it is deductively valid.

Note:

From now on, I'll just say 'valid' to mean 'deductively valid', and 'invalid' to mean 'deductively invalid'.

Exercise

Look at the following arguments carefully. Are they valid or invalid? Spell out the reasons for your answer.

It's daytime in term and we're in a large teaching building at the University.

There will be several people in other parts of the building.

Smoking heavily greatly increases the risk of heart disease.

Drinking more than 20 units of alcohol per week increases the risk of heart disease.

George smokes heavily and drinks 40 units of alcohol per week.

George will suffer from heart disease.

Gold test sample 1 had density 19.3g per cm³

Gold test sample 2 had density 19.3g per cm³

Gold test sample 3 had density 19.3g per cm³

[and so on... up to]

Gold test sample 1000 had density 19.3g per cm³

Gold has a density of 19.3g per cm³

George's salary as a finance officer at the University isn't big enough to meet payments on a Porsche.

George has been seen many times driving a Porsche.

George knows a lot about the University computer system.

George has been staying late in the office.

George seems nervous and on edge.

Money seems to have gone missing from University accounts.

George is stealing from University funds.

If God exists, then there is no unnecessary evil in the world.

God exists.

There is no unnecessary evil in the world.

If there is a God, then the world will be ordered in ways we'd expect in a product of intelligent design.

The world is ordered in ways we'd expect in a product of intelligent design.

Therefore, there is a wholly good and all-powerful God.

Validity and 'Good Argument'

Notice, *invalid* arguments are not always (intuitively) really bad arguments.

Some invalid arguments seem to be quite good, in that their premisses (if true) provide quite good reason to believe their conclusions.

So ...

Why focus on validity?

Why Focus on Validity?

Valid arguments are maximally reliable, in the sense that *if* the premisses of a valid argument are true, then the conclusion *must* be true.

For various reasons, philosophers have an interest in conclusive arguments (at least, apparently conclusive arguments).

We are going to begin to provide a *systematic* account of good reasoning. It turns out that it is *much* harder to provide a systematic account of good, non-deductive reasoning.

Often, where there's a non-deductive argument, we can construct a related deductive argument which can help us to see the issue more clearly.

Corresponding Invalid and Valid Arguments

If there is a God, then the world will be ordered in ways we'd expect in a product of intelligent design.

The world is ordered in ways we'd expect in a product of intelligent design.

Therefore, there is a wholly good and all-powerful God.

If the existence of a particular thing would explain something we see, and there is no other explanation (or no explanation as good) for that thing we see, then it is reasonable to believe in the existence of that thing.

The existence of God would explain the order we see in the world.

There is no other explanation (as good) of the order we see.

Therefore, it is reasonable to believe in the existence of God.

Validity and Abstraction

In evaluating arguments in terms of validity, we *abstract* from the actual truth or falsity of the premisses.

We say:

If the premisses were true, could the conclusion be false?

If the answer is 'yes', the argument is invalid.

If the answer is 'no', the argument is valid.

(Partial) Independence of Validity from *Actual* Truth and Falsity

There are valid arguments which have one or more false premisses:—

David Cameron is Prime Minister of the UK.

Whoever is Prime Minister of the UK is universally loved and admired by its people.

David Cameron is universally loved and admired by the people of the UK.

Rene Descartes was an Australian.

Every Australian there's ever been has been a famous philosopher.

Rene Descartes was a famous philosopher.

There are invalid arguments which have true premisses and true conclusions:—

Whales are not reptiles.

The Sun is a giant ball of very hot gas.

Ulysses is a novel by James Joyce.

Validity in Terms of Possible Situations

A **DEDUCTIVELY VALID ARGUMENT** is an argument such that there is no possible situation in which all of its premisses are true and its conclusion false.

An argument is **DEDUCTIVELY INVALID** if there is a possible situation in which all of its premisses are true and its conclusion false; *otherwise it's valid*.

The (So-Called) Paradoxes of Validity

If any of the premisses of an argument are necessarily false, or the premisses cannot all be true together, then the argument is **VALID**.

If the conclusion of an argument is necessarily true, then the argument is **VALID**.

- I can watch *The Sopranos*.
- It's false that I can watch *The Sopranos*.
- So, everyone here will get a first without trying.

- Tom Stoneham performs Dionysian rites every mid-summer's eve
- So, $2 + 2 = 4$.

'Consistent'

A set of statements (or claims) is **consistent** if and only if all of the statements can be true together.

A set of statements (or claims) is **consistent** if and only if it is possible for all of the statements to be true together.

Examples:

Set 1

Allen is a successful professional basketball player.

Allen is less than 6 feet 6 inches tall.

Set 2

Mike was in London at 1.00 p.m., 12/10/07.

Mike was in Sydney 0.01 seconds after 1.00 p.m., 12/10/07.

'Inconsistent'

A set of statements (or claims) is **inconsistent** if and only if it is **not** possible for all of the statements to be true together.

Examples:

Set 3

Allen is less than 6 feet 6 inches tall.

Allen is more than 6 feet 6 inches tall.

Set 4

Mike is clever or buff.

Mike is not clever.

Mike is not buff.

Possibility

“Possibility” has more than one sense.

In the definition of validity, “possible” is to be understood as relating to *logical* possibility.

Different types of possibility

P is **EPISTEMICALLY** possible (for me):
P is consistent with what I know.

P is **PHYSICALLY** possible: P is consistent with the laws of nature/laws of physics.

P is **LOGICALLY** possible: P is consistent with the laws of logic.

Logical Possibility and Other Forms of Possibility

Notice:

Other forms of possibility can be accounted for in terms of logical possibility and consistency.

Example

Something is *physically* possible if, and only if, it is

(a) logically possible

and

(b) consistent with the laws of physics

Why Be Interested in Validity?

- Valid arguments are utterly reliable: if an argument is valid and its premisses are true, there's no way for the conclusion to be false
- If you believe the premisses of a valid argument, then you should (rationally) believe the conclusion
- If you disbelieve the conclusion of a valid argument, then you should (rationally) reject at least one of the premisses

Argument Forms

Tom is easygoing or Tom is a philosopher.

Tom is not easygoing.

Tom is a philosopher.

There will be talks or a widespread conflict will break out.

There will not be talks.

A widespread conflict will break out

John is in the lecture or John is in the bar.

John is not in the lecture.

John is in the bar.

Sentences as Components of Sentences

(1) Tom is easygoing or Tom is a philosopher.

(2) Tom is not easygoing.

Tom is a philosopher.

Tom is easygoing (Part of premiss 1)

Tom is not easygoing (Premiss 2)

It is not the case that Tom is easygoing.

Tom is easygoing or Tom is a philosopher.

It is not the case that Tom is easygoing.

Tom is a philosopher.

α or β

It is not the case that α

β

Key Concept:

Formal Validity

- (1) Tom is easygoing or Tom is a philosopher.
(2) Tom is not easygoing.
-

Tom is a philosopher.

The **FORM** of this argument is:

Either α or β .

It's not the case that α .

So β .

This is a **VALID FORM OF ARGUMENT**. That is, every argument which has this form is valid, *whatever* the subject matter.

Non-Formal Validity

...validity which is *not* simply a matter of the logical structure of the statements involved.

This table is brown.

Therefore, this table is coloured.

Barry is taller than David

David is taller than Tom

Therefore, Barry is taller than Tom

Note: There is debate over where formal validity ends and non-formal validity begins.

We'll largely sidestep these issues by concentrating on the logical powers of particular expressions.

'Sound'

A **sound** argument is an argument which is:

- (i) valid, and
- (ii) has true premisses.

Use and Mention

In the normal course of conversation and discussion we simply *use* expressions.

In logic, we want to be able to talk about (or *mention*) expressions. (In order to talk about the meaning of the expression, for instance.)

Example:

- Tom Stoneham is the head of Philosophy at York.
- ‘Tom Stoneham’ is the name of the head of Philosophy at York.
- In (1) the expression ‘Tom Stoneham’ is *used* to refer to Tom Stoneham.
- In (2) the expression ‘Tom Stoneham’ is *mentioned*.

Use/Mention & Quotation Marks

By putting quotation marks around an expression (a character, a word, or a string of words), we create an expression which *stands for* that expression.

We use the quotation-mark expression when we want to *mention* the expression.

(a) A colon consists of two dots.

'A colon' consists of six characters.

The expression 'a colon' appears at the beginning of sentence (a).

Other Uses of Quotation Marks

Note that in logic we will be using quotation marks to allow us to talk about (mention) particular expressions.

Don't confuse this kind of use with other kinds of use of quotation marks:

—As 'scare quotes' to indicate doubts about the concept used or its particular application (e.g. I don't worry about the "Paradoxes" of Validity. Tom enthused about Christina's "fantastic vocals".)

—As devices to indicate direct speech (e.g. Tom said he "found Anastacia inspiring".)

Key Points

Valid arguments are those where it is not possible for all of the premisses true to be true and the conclusion false.

Some arguments are *formally* valid: they are valid, and their validity depends only upon their form—the way they are built up from logical and non-logical vocabulary.

Formally valid arguments depend for their validity on the meaning of the logical vocabulary which appears in them.