Philosophical Arguments
(A short overview for use in courses)
Steven Horst, Wesleyan University

One of the primary achievements of ancient philosophy was an examination of how arguments are structured, and what features make for a good argument. Later philosophers would refine our understanding of logic, and also develop clearer and more perspicuous ways of writing out arguments that make the assumptions explicit and allow easier evaluation of whether those assumptions fully support the conclusion.

In philosophical parlance, an argument is a sequence of statements/propositions with a particular sort of logical structure. What makes an argument an argument is that it starts out with a set of propositions taken as assumptions (called **premises**) and uses these to justify another proposition (called the **conclusion**).

There are several forms of arguments, but the most basic form is the **deductive** argument. Such an argument is formulated with the intention that the premises "support" the conclusion in the very strong sense that, *if the premises are true, the conclusion must be true as well*. A deductive argument that succeeds in this aim is described as **valid**. One that does not is described as **invalid**.

The Basics: Making the Steps Explicit

In stating and evaluating arguments, it is helpful to make them as explicit as possible, by:

- separating the various claims so that each proposition is stated separately
- identifying which propositions are used in the argument as premises (i.e., things that are assumed rather than argued for) and which are conclusions
- indicating which premises are supposed to entail the conclusion.

One way of doing this is to *number* each proposition, and to indicate the conclusions by preceding them with the word *therefore* (or a logical notation that means the same thing) and citing the supporting premises after the conclusion within parentheses. For example:

1) All humans are mortal.
2) Socrates is a human.

Therefore,

3) Socrates is mortal (from 1 and 2)

I used the term "conclusions" in the plural because an argument sometimes will have intermediate conclusions along the way. For example,

1) All humans are animals
2) All animals are mortal

Therefore

3) All humans are mortal (1,2)
4) Socrates is a human

Therefore

5) Socrates is mortal (3,4)

Note that in this longer argument proposition (3) is the *conclusion* of the first subargument (1-3), and is then used as a *premise* in the second subargument (3-5). The status of a proposition as a premise or a conclusion is not something that can be determined just by looking at the proposition itself. Rather, it is determined by the place/role of the proposition within an argument.

Truth and Validity

In order to speak perspicuously about arguments, philosophers have developed some technical terminology which draws upon ordinary language, but whose meanings are not quite the same as their ordinary meanings. It is important to use these terms – 'true', 'false', 'valid', 'invalid' – in their technical meanings when engaged in philosophical writing.

Propositions, like "all humans are mortal", are the sorts of things that can be true or false. Standard logics assume that every proposition is either true or false. (There are also logics that allow for indeterminate truth values, but we will stick with standard logics here.)

Arguments, on the other hand, consist of multiple propositions, and what makes an argument *good* as an argument is how the propositions are related to one another. In particular, a good deductive argument is one in which the premises entail the conclusion – that is, if the premises are true, the conclusion must be true as well. As we said above, arguments that have this feature are called *valid*, and those that lack it *invalid*. Validity and invalidity are thus properties of *argumentative structures*.

Propositions cannot be valid or invalid, because they are not composed of premises and a conclusion. Arguments, on the other hand, cannot be true or false, because those terms apply only to individual claims (propositions), not to logical structures (arguments). Note that observing this distinction may require you to refrain from using some expressions of ordinary language, such as "Sam made a valid point." If a "point" is a proposition, it cannot be either valid or invalid in the technical philosophical sense of the words 'valid' and 'invalid'. These words have a *different meaning* within philosophy, and so, when you are doing philosophy, you should try to use them *only* in their technical philosophical senses.

Two Parts of Evaluating an Argument

There are thus two importantly different kinds of questions to ask in evaluating an argument. The first is whether the argument, as a whole, is *valid* – that is, whether it is possible for the premises to be true and the conclusion false. The second is to ask whether the premises are true. It is crucial to understand that these two things are *independent of each other*. There can be valid arguments with true premises, valid arguments with false premises, invalid arguments with true premises, and invalid arguments with false premises. (And even with invalid arguments with false premises, the conclusion might still accidentally end up being true.) Here are some examples of each type:

	True Premises	False Premises
Valid Argument	All humans are mortal Socrates is human *Therefore*, Socrates is mortal	All fish are plants Socrates is a fish *Therefore* Socrates is a plant
Invalid Argument	All humans are mortal Lassie is mortal *Therefore* Lassie is Human	All fish are plants Socrates is a dog *Therefore* Socrates is mortal

Clarifying the Form of Arguments – Schematization (in Sentential Logic)

It is sometimes easier to assess whether an argument is valid or invalid by abstracting away from its content. One way of doing this is to substitute meaningless letters for sentences or words. This is called **schematizing** an argument. For example, take the argument:

1) If Socrates is human, then Socrates is mortal.
2) Socrates is human.

therefore

3) Socrates is mortal. (from 1 and 2)

Each step in this argument is composed from one or both of two propositions, "Socrates is human" and "Socrates is mortal". So let's assign letter-names to each of these:

A: "Socrates is human"
B: "Socrates is mortal"

We can now see that the argument has the following form:

1*) If A then B
2*) A
therefore
3*) B (from 1 and 2)

If you think about it, it should become clear that if the both premises are true, the conclusion *must* be true is well. If A is true, and "If A then B" is true, B must be true as well. And this holds good *no matter what* propositions the letters A and B stand for. So what we have here is a basic *form* of argument that is valid, no matter what propositions we substitute for A and B. The basic valid argument forms have been given names long ago, in Latin. This particular form is called *modus ponens*.

Here are some additional simple valid argument forms:

Modus Tollens

If A then B
Not-B (i.e., B is false)
Therefore
Not-A

Disjunctive Syllogism

Either A or B (i.e., either A is true, or B is true, or both are true)
Not-A
Therefore
B

Hypothetical Syllogism

If A then B
If B then C
Therefore
If A then C

Two things to note:

i) In this kind of schematization, the letters replace whole sentences of propositions. (We will discuss another kind of schematization as well, in which letters stand for particular types of words – names and predicates.)
ii) Whether an argument is valid or invalid is independent of whether the propositions are true or false. For example, here is another argument of the *modus ponens* form, which is always valid:

If Socrates is human, then Socrates is a fish.
Socrates is human
Therefore,
Socrates is a fish.

The first premise and the conclusion are both false. But the argument is still valid, because *if* the premises were both true, the conclusion would have to be true as well – i.e., there is no way that both premises could be true and the conclusion false.

A Second Type of Schematization (Predicate Logic)

The second way of schematizing arguments is to use letters to replace words that denote individuals and their properties. In logic, the former are called *names* (if they refer to a particular individual) or *variables* and the latter *predicate letters*. For example, we can take the proposition "Socrates is human" and let the letter H stand for "human" and s for Socrates. (Generally variables are lower-case and predicate letters capitalized.) So the form of the proposition is:

s is an H

or, in a more formal notation

Hs

(The variable which denotes an object is generally placed after the predicate letter.)

Similarly, the proposition "All humans are mortal" can be schematized as

All H's are M's. (where M stands for "mortal")

So now we can take an argument like

All humans are mortal.
Socrates is human.
Therefore
Socrates is mortal

And we can schematize it as follows:

All H's are M's.
s is an H
therefore
s is an M.

This too is a valid argument form. In this particular example, the letter s stands for an individual. There is also a slightly more complicated form of schematization in which the lower-case letters are not like names but are *variables* that can stand for any number of individuals. Doing it this way, "all humans are mortal" would be schematized by using a variable letter like x and *quantifying* over it:

For every x (If x is an H, then x is a M), or equivalently,

For every x (If Hx, then Mx).

We can thus rewrite the previous argument in either of the following ways:

For every x (If x is an H, then x is an M)
s is an H
therefore
s is an M

or

For every x (If Hx, then Mx)
Hs
Therefore
Ms

More Formal Symbolism

Logic also has ways of symbolizing expressions like "for every" and "if…then". Here are some important notational conventions you may encounter in reading philosophy:

Universal quantification: ∀x = "for every x"
Existential quantification: ∃x = "there exists an x such that…"

e.g., ∃x(Hx) = "there is an x such that x is an H"

Negation: ˜ = "not"

e.g., ˜ P = "not-P" (where P is a proposition – i.e., P is false)
∃x(˜ Hx) = "there is an x that is not H"
˜ ∃x(Hx) = "it is not the case that there is an x that is H"

Implication: P ⊃ Q = "If P then Q"
Conjunction ("and"): P ∧ Q = "P and Q" (the ampersand & is also used for "and")
Disjunction ("or"): P ∨ Q = "P or Q"