Arguments: the Good, the Bad, and the Ugly

When we say 'What a beautiful day!', we neither make an argument nor express a proposition. But what is a *proposition*? Here is one:

p   Assisted suicide is morally acceptable.

Some agree with *p*: for them, *p* is true. Others disagree: for them, *p* is false. Propositions can be expressed in a sentence or a statement, or they can only be thought, but the main point is that propositions are the 'things' that can be true or false. In philosophical jargon: propositions have truth-values.

Given the disagreement over *p*, we need a *reason* to reject or accept *p*. We need to be convinced either way. That is, we need an argument. But what is an *argument*? Something like this:

(A)   Premise 1:   (Some proposition).
       Premise 2:   (Some other proposition).
       Conclusion: *Therefore*, assisted suicide is morally acceptable. (Therefore, *p*.)

Arguments are chains of propositions, arranged in a formal structure. An argument moves from premises to a conclusion, such that the conclusion *follows from* the premises. So, an argument connects propositions in some rational manner. Arguments can be *valid*: if the premises are true, then the conclusion could not be false. In this case, we might say that the conclusion is 'conclusive'. That is, validity concerns the formal connection between the premises and the conclusion. This connection need not be obvious, see A1 and A2 (which are both valid):

(A1)   Premise: Grass is green and fish have gills.
       Conclusion: Fish have gills.

(A2)   Premise: All cats purr.
       Conclusion: All non-purring things are non-cats.

An argument can also be *sound*: if it is valid *and* has true premises. A sound argument is a formally valid argument with true premises. Both A1 and A2 are sound, but they are still daft arguments, because the premises give us no good reason to accept the conclusion. Note that arguments themselves cannot be true or false, because they are not propositions.

To test arguments for validity and soundness, we can ask two questions: (1) Are the premises all true? (2) Does the conclusion 'follow from' the premises?

This gives us *four cases* (yes/yes; yes/no; no/yes; no/no). In the first case, we answer yes to both questions. Consider Argument A3:

(A3) Premise 1:   All humans are mortal.
      Premise 2:   Socrates is human.
      Conclusion: Therefore, Socrates is mortal.

A3 is *sound*, since all premises are true and the conclusion follows. In fact, A3 is an excellent (deductive) argument: its premises give us a very good reason to accept the conclusion.

Yet, like all deductive arguments, A3 is a bit dull. This is because in deductive arguments the conclusion is extracted from the premises. Since the conclusion is contained in the premises, this is more like a recombination; but the premises lend maximal support for the conclusion.

In the second case, the premises are true, but the conclusion does *not* follow from them. Consider Argument A4, whose structure looks deceptively similar to A3:

(A4) Premise 1:   All cats are furry.
      Premise 2:   Fido the dog is furry.
      Conclusion: Therefore, Fido is a cat.

Of course, Fido is not a cat; so something is seriously wrong with A4, even if both premises are true. Consider also Argument A5:

(A5) Premise 1:   All squirrels have four legs.
      Premise 2:   All dogs have four legs.
      Conclusion: Therefore, all dogs are squirrels.

Both A4 and A5 have *true* premises, but false conclusions. So, the conclusion does not follow from the premises. Indeed, we have no reason to accept the conclusion: the premises do not oblige us to accept the conclusion. An argument with true premises and a false conclusion is *invalid*. Both A4 and A5 involve a logical (formal) fallacy.[1] Therefore, these arguments are bad.

In the third case, the argument has one or more false premises, but the conclusion *does* follow from them. This may seem surprising:

---

1 Aside for experts: the fallacy is that of the 'undistributed middle'. The middle term (are/is furry, have four legs) is not distributed in either premise; but it should be distributed at least once (as in, e.g., 'All furry things are dogs', or 'All four-legged creatures are dogs', which, of course, is false). The middle term appears once in each premise, but not in the conclusion. 'Middle term' and 'distribution' originate in medieval syllogistic. More of this later.

(A6) Premise 1:   If Britain goes to war, then there are weapons of mass
     destruction in Iraq.
     Premise 2:   Britain goes to war.
     Conclusion: Therefore, there are WMD in Iraq.

Thanks to its logical structure, A6 is formally *valid*. But it has a false conclusion: there are no WMD in Iraq. We could say that Premise 1 is false too: Britain goes to war not just in case there are WMD in Iraq. In philosophical terminology: the presence of WMD in a country is not necessary for going to war with that country. (The *belief* that there are is another matter.) So, A6 is unsound, even though it is valid.[2]

Here is another example:

(A7) Premise 1:   Socrates got his degree from Oxford University.
     Premise 2:   People with a degree from Oxford are smart.
     Conclusion: Therefore, Socrates was smart.

Premise 2 is true, of course. But Premise 1 is false. This makes A7 unsound. Still, the conclusion follows from the (dodgy) premises, which makes A7 formally *valid*. As in A1, the conclusion is true, but we have no reason to accept it: it is true by accident, as it were.

It is important to keep in view that validity concerns *exclusively* the logical structure of an argument: *if* the premises are true, the conclusion cannot be false. This is why valid but unsound arguments are possible. Not all valid arguments are sound; but all sound arguments are valid. Valid arguments can be unsound; but no sound argument could be invalid.

In the last case the premises are false and the conclusion does not follow from the premises either:

(A8) Premise 1:   All philosophers are female.
     Premise 2:   David Beckham is female.
     Conclusion: Therefore, David Beckham is a philosopher.

A8 is ugly; everything is wrong with it. We have absolutely no reason to accept anything, in spite of an apparent connection between the premises and the conclusion. A8 is unsound because of its false premises, and it is invalid because of a

---

2 Conditional propositions are at the heart of two important formal fallacies, one of which is at work in A6 *viz*. 'denying the antecedent'. A conditional is an 'if… then…' proposition. The *if*-clause is the *antecedent*, and the *then*-clause is the *consequent* of the conditional. *Denying the Antecedent*: from the premises 'If it rains then the street is wet' ($p \supset q$), and 'It does not rain' ($\sim p$), we *cannot* conclude that 'the street is not wet' ($\sim q$): someone might use a hosepipe, say. More on formal fallacies later.

defective logical structure. Even if the premises *were* true, the conclusion still would not follow.

So, should we always reject the conclusion of an invalid argument? No. Even if an invalid argument tells us nothing about the truth of the conclusion, we might have *other reasons* to accept the concluding proposition. For instance, we might endorse the conclusion on moral grounds. To repeat: invalid arguments could have true conclusions. They could also have false conclusions. This is because validity does not say anything about the truth of the conclusion.[3] This point is relevant for *inductive* arguments, where we conclude from all past cases to future cases (A9), or from all observed cases to all cases (A10):

(A9) Premise 1:   I visited Paris last spring and it rained.
      Premise 2:   I visited Paris last summer and it rained.
      Conclusion: When I visit Paris this autumn it will rain.

(A10) Premise 1:   Fido barks.
      Premise 2:   Rex barks.
      Premise 3:   Lassie barks.
      Conclusion: All dogs bark.

Inductive arguments can never be valid, and therefore not sound either. Still, they can be good or powerful—and indeed, indispensable—arguments. As David Hume points out, we constantly rely on them in our everyday lives.

---

3   Remember: *propositions* (premises, conclusions) are true or false; but *arguments* are not true or false. Rather, they are valid, invalid, sound, or unsound.