
Validity and arguments

Before turning to explore some formal techniques for evaluating arguments, we should pause to say a little more about the ‘classical’ conception of validity for individual inference steps, and also say more about what makes for cogent multi-step arguments.

6.1 Classical validity again

In Chapter 1, we introduced the intuitive idea of an inference’s being deductively valid – i.e. absolutely guaranteeing its conclusion, given the premisses. Then in Chapter 2, we gave the classic definition of validity, which is *supposed* to capture the intuitive idea. But does our definition really do the trick?

A reminder, and a quiz. We said that an inference is (‘classically’) valid if and only if there is no possible situation in which the premisses are true and the conclusion false. So consider: *according to that definition*, which of the following inferences are classically valid?

- A Jo is married; so Jo is married.
- B Socrates is a man; Jo is married; all men are mortal; so Socrates is mortal.
- C Jack is married; Jack is single; so today is Tuesday.
- D Elephants are large; so either Jill is married or she is not.

And then ask: which of the inferences are *intuitively* deductively compelling? Do your answers match?

(1) Trivially, there is no possible way that A’s premiss ‘Jo is married’ could be true and its conclusion ‘Jo is married’ be false; so the first inference is indeed valid by the classical definition.

What is the intuitive verdict about this argument? Of course, the inference is no use at all as a means for *persuading* someone who does not already accept the the conclusion as correct. Still, truth-preservation is one thing, being useful for persuading someone to accept a conclusion is something else (after all, a valid argument leading to an unwelcome conclusion can well serve to persuade its recipient of the falsehood of one of the premisses, rather than the truth of the

conclusion). Once we make the distinction between truth-preservation and usefulness, there is no reason not to count the ‘Jo’ argument as deductively valid. As we put it in §3.2, an inference that covers no ground hasn’t got a chance to go wrong!

Objection: ‘It was said at the very outset that arguments aim to give *reasons* for their conclusions – and the premiss of **A** doesn’t give an independent reason for its conclusion, so how can it be a good argument?’ Reply: Fair comment. We’ve just agreed that **A** *isn’t* a persuasive argument, in the sense that it can’t give anyone who rejects the conclusion a reason for changing their minds. Still, to repeat, that doesn’t mean that the inferential relation between premiss and conclusion isn’t absolutely secure. And the intuitive idea of validity is primarily introduced to mark absolutely secure inferences: **A** just illustrates the limiting case where the security comes from unadventurously staying in the same place.

(2) Argument **B** with a redundant and irrelevant premiss also comes out as valid by the classical definition. There can be no situation in which Socrates is a man, and all men are mortal, yet Socrates is not mortal. So there can be no situation in which Socrates is a man, all men are mortal, and (as it happens) Jo is married, yet Socrates is not mortal.

What’s the intuitive verdict on **B**? Well, introducing redundant premisses may be pointless (or worse, may be misleading). But **B**’s conclusion is still guaranteed, if all the premisses – including the ones that really matter – are true.

Generalizing, suppose A_1, A_2, \dots, A_n logically entail C . Then A_1, A_2, \dots, A_n, B logically entail C , for any additional premiss B (both intuitively, and by our official definition).

Deductive inference contrasts interestingly with inductive inference in this respect. Recall the ‘coffee’ argument in §1.3:

- E (1) Cups of coffee that looked and tasted just fine haven’t killed you in the past.
 (2) This present cup of coffee looks and tastes just fine.
 So (3) This present cup of coffee won’t kill you.

The premisses here probabilistically support the conclusion. But add the further premiss

- (2’) The coffee contains a tasteless poison,

and the conclusion now looks improbable. Add the further premiss

- (2’’) The biscuit you just ate contained the antidote to that poison,

and (3) is supported again (for it is still unlikely the coffee will kill you for any other reason). This swinging to and fro of degree of inductive support as further relevant information is noted is one reason why the logic of inductive arguments is difficult to analyse and codify. By contrast, a deductively cogent argument can’t be spoiled by adding further premisses.

(3) So far so good. We can readily live with the results that completely trivial arguments and arguments with redundant premisses count as deductively valid

by the classical definition. But now note that there is no possible situation in which Jack is both married and single. That is to say, there is no possible situation where the premisses of argument C are both true. So, there is no possible situation where the premisses of that argument are both true and the conclusion false. So, this time much less appealingly, the inference in C also comes out as valid *by the classical definition*.

The point again generalizes. Suppose that a bunch of propositions A_1, A_2, \dots, A_n is logically inconsistent, i.e. there is no possible situation in which A_1, A_2, \dots, A_n are all true together. Then there is also no situation in which A_1, A_2, \dots, A_n are all true and C is false, whatever C might be. Hence by our definition of classical validity, we can validly infer *any proposition we choose* from a bunch of inconsistent premisses.

That all looks decidedly counter-intuitive. Surely the propositions ‘Jack is married’ and ‘Jack is single’ can’t really entail anything about what day of the week it is.

(4) What about the ‘Jill’ argument? There is no possible situation in which the conclusion is false; it is inevitably true that either Jill is married or she isn’t. So, there is no possible situation where the conclusion is false and the premiss about elephants is true. Hence the inference in argument D is also valid by the classical definition.

The point again generalizes: If C is necessarily true, i.e. there is no possible situation in which C is false, then there is also no situation in which A_1, A_2, \dots, A_n are all true, and C is false, whatever A_1, A_2, \dots, A_n might be. Hence by our definition, we can validly infer a necessarily true conclusion *from any premisses we choose*, including elephantine ones.

Which again looks absurd. What to do?

6.2 Sticking with the classical definition

We have just noted a couple of decidedly counter-intuitive results of the classical definition of validity. Take first the idea that contradictory premisses entail anything. Then one possible response runs along the following lines:

We said that the premisses of a valid argument *guarantee* the conclusion: how can contradictory premisses guarantee anything? And intuitively, the conclusion of an inferentially cogent inference ought to have *something* to do with the premisses. So argument C commits a fallacy of irrelevance. Our official definition of validity therefore needs to be tightened up by introducing some kind of relevance-requirement in order to rule out such examples as counting as ‘valid’. Time to go back to the drawing board.

Another response runs:

The verdict on C is harmless because the premisses can never be true together; so we can never *use* this type of inference in a *sound* argument for an irrelevant conclusion. To be sure, allowing the ‘Jack’ argument to count as valid looks surprising, even counter-intuitive. But maybe we shouldn’t

slavishly follow *all* our pre-theoretical intuitions, especially our intuitions about unusual cases. The aim of an official definition of validity is to give a tidy ‘rational reconstruction’ of our ordinary notion which smoothly captures the uncontentious cases; the classical definition does that particularly neatly. So we should bite the bullet and accept the mild oddity of the verdict on C.

Likewise there are two responses to the observation that the classical definition warrants argument D. We could either say this just goes to show that our definition allows more gross fallacies of irrelevance. Or we could bite the bullet again and deem this result to be a harmless oddity (we already need to know that a conclusion C is necessarily true before we are in a position to say that it is classically entailed by arbitrary premisses – and if we already know that C is necessary, then extra valid arguments for it like D can’t extend our knowledge).

The majority of modern logicians opt for the second responses. They hold that the cost of trying to construct a plausible notion of ‘relevant’ inference turns out to be too high in terms of complexity to make it worth abandoning the neat simplicity of the idea of classical validity. But there is a significant minority who insist that we really should be going back to the drawing board, and hold that there are well-motivated and workable systems of ‘relevant logic’. We won’t be able to explore their arguments and their alternative logical systems here – and in any case, these variant logics can really only be understood and appreciated in contrast to classical systems. We just have to note frankly that the classical definition of validity is not beyond challenge.

Still, our basic aim is to model certain forms of good reasoning; and models can be highly revealing even if some of their core constructs idealize. The idea of a ‘classically valid argument’ – like e.g. the idea of a ‘ideal gas’ – turns out at least to be a *highly* useful and illuminating idealization: and this can be so even if it would be wrong to claim that it is in the end the uniquely best and most accurate idealization. Anyway, we are going to stick to the classical definition in our introductory discussions in this book.

6.3 Multi-step arguments again

We characterized deductive validity as, in the first place, a property of individual *inference steps*. We then fell in with the habit of calling a *one-step* argument valid if it involves a valid inference step from initial premisses to final conclusion. In this section, we’ll see the significance of that qualification ‘one-step’.

Consider the following mini-argument:

- F (1) All philosophers are logicians.
 So (2) All logicians are philosophers.

The inference is obviously fallacious. It just doesn’t follow from the assumption that all philosophers are logicians that only philosophers are logicians. (You might as well argue ‘All women are human beings, hence all human beings are women’.) Here’s another really bad inference: