

One kind of validity is

Modal Validity

an argument is modally valid iff it is impossible that all its premises are true and its conclusion is false

This argument,

The Dog Argument

Rover is a dog
Therefore,
Rover is a mammal

is modally valid. It is modally valid because it is impossible that Rover is a dog but not a mammal.

But there are other kinds of validity that do not appeal to impossibility. One of those notions of validity is *formal* validity. A definition of formal validity is different:

Formal Validity

an argument is formally valid iff (holding the meanings of the connectives fixed) every interpretation of the premises on which they are true is an interpretation of the conclusion on which it is true.

Consider The Dog Argument again. It is modally valid. But it is formally *invalid*. Here is an interpretation of its words on which its premise is true but its conclusion is false: ‘dog’ means dog but ‘mammal’ means reptile. On this interpretation, its premise is true because Rover *is* a dog but its conclusion is false because Rover is *not* a reptile.

You might think that this is cheating because ‘mammal’ does not mean reptile. Fair enough. But people interpret words in very different ways, especially when making or responding to arguments. This is why formal validity is so useful. Formal validity gives us a notion of validity that works *no matter* how a person interprets some words. People can interpret words *however* they like, and still, there is an objective, decidable fact of the matter about whether their arguments are formally valid.

Formal validity is also useful because if we try to make formally valid arguments, we *discover* hidden assumptions. For example, we can exchange The Dog Argument for a formally valid argument by adding a premise:

The Dog Argument 2.0

Rover is a dog
If Rover is a dog then Rover is a mammal
Therefore,
Rover is a mammal

This argument is both modally and formally valid (because it is impossible that the premises are true and the conclusion is false, and because it is an instance of *modus ponens*). Consider the earlier interpretation we used to show that The Dog Argument was formally invalid: ‘dog’ means dog and ‘mammal’ means reptile. *Even on that interpretation*, if the premises of The Dog Argument 2.0 are true then so is the conclusion, because the two premises now guarantee that, *whatever* ‘mammal’ means, Rover is a mammal. So, by trying to make The Dog Argument formally valid, we *discovered* a hidden assumption: if Rover is a dog then Rover is a mammal.

Now, that might seem like a pretty boring assumption to “discover”. But when it comes to more complicated, serious, and in-depth arguments, the discoveries are much more interesting. This is why *formal* validity is the sort of validity I want you to focus on in this course. Trying hard to make your arguments *formally* valid (rather than merely modally valid) will help you make discoveries.