

A Which of the following types of inference step are valid (i.e. are such that all their instances are valid)?

1. Some F are G ; no G is H ; so, some F are not H .

Valid (those F s which are G are not H).

2. Some F are G ; some F are H ; so, some G are H .

Invalid: consider 'Some humans and men; some humans are women; so some men are women'.

3. All F are G ; some F are H ; so, some H are G .

Valid (those F which are H are also G).

4. No F is G ; some G are H ; so, some H are not F .

Valid (those G which are H are also not F).

5. Some F are G ; no G is H ; so, some F are not H .

Valid (those F which are G are not H).

6. No F is G ; no G is H ; so, some F are not H .

Invalid: consider 'No brother is a woman; no woman is a man; so some brothers are not men'!

B What of the following patterns of argument? Are these valid?

1. All F are G ; so, nothing that is not G is F .

Valid.

2. All F are G ; so, at least one thing is F and G .

Disputable. Consider the store notice 'All shop-lifters will be reported to the police' – couldn't that be true, and yet successfully deter all potential thieves. Couldn't Newton's first law of motion 'Objects subject to no net forces have constant velocity' be true of a world where, as it happens, no object is subject to some net force?

3. All F are G ; no G are H ; some J are H ; so, some J are not F .

Valid (those J which are H are not G , and hence not F).

4. There is an odd number of F , there is an odd number of G ; so there is an even number of things which are either F or G .

Invalid (maybe some things are F and G !).

5. *m is F; n is F; so, there are at least two F.*

Invalid (maybe m is none other than n!)

6. *All F are G; no G are H; so, all H are H.*

Valid on the classical definition, since the conclusion is necessarily true!

C *Is the following argument*

Dogs have four legs

Fido is a dog

So Fido has four legs.

of the same form as

All dogs have four legs

Fido is a dog

So Fido has four legs?

The answer depends on whether you think that *Dogs have four legs* comes to the same as *All dogs have four legs*; and arguably it doesn't. *Dogs have four legs* is naturally read as expressing a truth – the same truth as is expressed by saying that dogs are quadrupeds. But that truth is quite consistent with some particular dog having lost a leg in an accident or even being defective and having been born without one—i.e. the truth expressed by *Dogs have four legs* is (so to speak) about the natural state of dogginess, and is consistent with poor Fido departing from the norm.