Peter Smith, *Introduction to Formal Logic* (CUP, 2nd edition)

Exercises 2: Validity, soundness, etc.

(a) Which of the following claims are true and which are false? Explain why the true claims hold good, and give counterexamples to the false claims.

(1) The premisses and conclusion of an invalid argument must together be inconsistent.

(2) If an argument has false premisses and a true conclusion, then the truth of the conclusion can't really be owed to the premisses: so the argument cannot really be valid.

(3) Any inference with actually true premisses and a true conclusion is truth-preserving and so valid.

(4) You can make a valid argument invalid by adding extra premisses.

(5) You can make a sound argument unsound by adding extra premisses.

(6) You can make an invalid argument valid by adding extra premisses.

(7) If some propositions are consistent with each other, then adding a further true proposition to them can't make them inconsistent.

(8) If some propositions are jointly inconsistent, then whatever propositions we add to them, the resulting propositions will still be jointly inconsistent.

(9) If some propositions are jointly consistent, then their denials are jointly inconsistent.

(10) If some propositions are jointly inconsistent, then we can pick any one of them, and validly infer that it is false from the remaining propositions as premisses.

(b*) Show that

(1) If A entails C, and C is equivalent to C', then A entails C'.

(2) If A entails C, and A is equivalent to A', then A' entails C.

(3) If A and B entail C, and A is equivalent to A', then A' and B entail C.

Can we therefore say that 'equivalent propositions behave equivalently in arguments'?