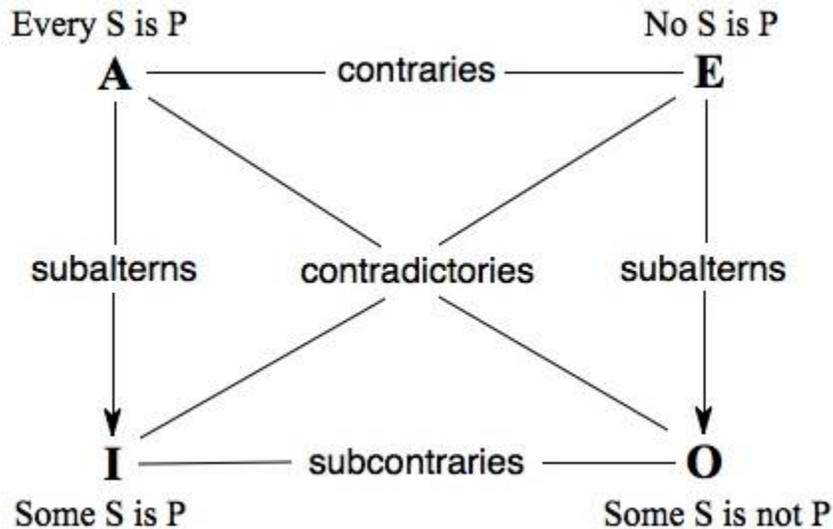


The square of opposition is a chart that was introduced within classical (categorical) logic to represent the logical relationships holding between certain propositions in virtue of their form. The square, traditionally conceived, looks like this:



The four corners of this chart represent the four basic forms of propositions recognized in classical logic:

A propositions, or *universal (absolute) affirmatives* take the form: *All S are P*.

E propositions, or *universal (absolute) negations* take the form: *No S are P*.

I propositions, or *particular (relative) affirmatives* take the form: *Some S are P*.

O propositions, or *particular (relative) negations* take the form: *Some S are not P*.

Given the assumption made within classical (Aristotelian) categorical logic, that every category contains at least one member, the following relationships, depicted on the square, hold:

Firstly, (A) and (O) propositions are *contradictory*, as are (E) and (I) propositions.

Propositions are contradictory when the truth of one implies the falsity of the other, and conversely. Here we see that the truth of a proposition of the form *All S are P* implies the falsity of the corresponding proposition of the form *Some S are not P*. For example, if the proposition “all industrialists are capitalists” (A) is *true*, then the proposition “some industrialists are not capitalists” (O) must be *false*. Similarly, if “no mammals are aquatic” (E) is *false*, then the proposition (I) “some mammals are aquatic” must be *true*.

Secondly, (A) and (E) propositions are *contrary*.

Propositions are contrary when they cannot both be true. An (A) proposition, e.g., “all giraffes have long necks” cannot be true at the same time as the corresponding (E) proposition: “no giraffes have long necks.” Note, however, that corresponding (A) and (E) propositions, while contrary, are not contradictory. While they cannot both be true, they *can* both be false, as with the examples of “all planets are gas giants” and “no planets are gas giants.”

Next, (I) and (O) propositions are *subcontrary*.

Propositions are subcontrary when it is impossible for both to be false. Because “some lunches are free” is false, “some lunches are not free” must be true. Note, however, that it is possible for corresponding (I) and (O) propositions both to be *true*, as with “some nations are democracies,” and “some nations are not democracies.” Again, (I) and (O) propositions are subcontrary, but not contrary or contradictory.

Next, (A) and (I) propositions are *subaltern*, as are (E) and (O) propositions.

Propositions are said to stand in the relation of subalternation when the truth of the first (“the superaltern”) implies the truth of the second (“the subaltern”), but not conversely. A propositions stand in the subalternation relation with the corresponding (I) propositions. The truth of the (A) proposition “all plastics are synthetic,” implies the truth of the proposition “some plastics are synthetic.” However, the truth of the (O) proposition “some cars are not American-made products” does not imply the truth of the E proposition “no cars are American-made products.” In traditional logic, the truth of an (A) or (E) proposition implies the truth of the corresponding (I) or (O) proposition, respectively. Consequently, the falsity of an (I) or (O) proposition implies the falsity of the corresponding (A) or (E) proposition, respectively. However, the *truth* of a particular proposition does not imply the truth of the corresponding universal proposition, nor does the falsity of a universal proposition carry downwards to the respective particular propositions.