Second World Congress on the Square of Opposition

General Patterns of Opposition Squares and 2n-gons

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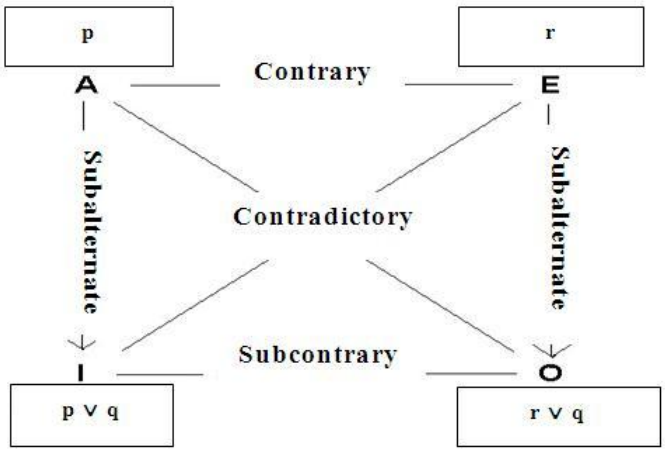
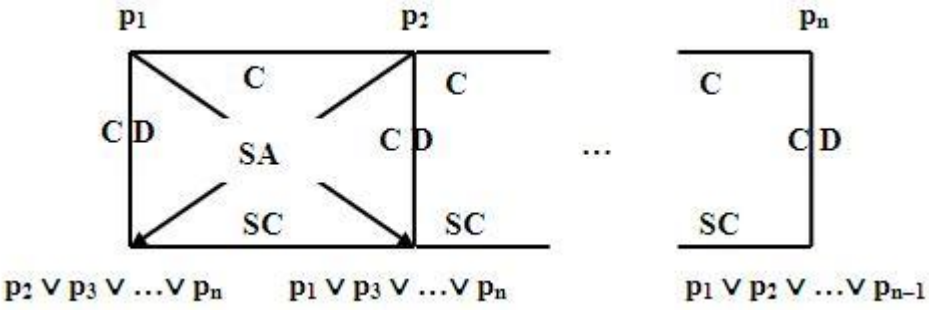
I will show that the classical square of opposition (SO) can be generalized to the "General Pattern of Squares of Opposition" (GPSO), which has two forms, denoted GPSO1 and GPSO2. For example, GPSO1 is as follows: if we have 3 propositions p, q, r that make up a trichotomy, then they can be used to construct the following SO:



However, the figure above shows an asymmetry among p, q and r: while each of p and r appears as independent propositions in the two upper corners, q only appears as parts of two disjunctions in the lower corners. To achieve symmetry, we need a hexagon composed of the following six propositions: p, q, r, p ∨ q, r ∨ q, p ∨ r. Thus, a trichotomy is most naturally related to a hexagon rather than a square.

The relationship between a trichotomy and a hexagon may be generalized to the relationship between an n-chotomy and a 2n-gon. Given n propositions $p_1, \ldots p_n$ that make up an n-chotomy, we may construct the following 2n-gon of opposition (SA = subalternate, CD = contradictory, C = contrary, SC = subcontrary):



To achieve even greater generality, I will also explore the possibility of further generalizing the 2n-gons to 2^n-gons by generalizing the opposition relations.