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The maximal system of basic homogeneous polycontextural sign relations

1. In Toth (2009), I started, based on the following abstract polycontextural semiotic matrix

$$\begin{pmatrix} 1.1_{a,b} & 1.2_{c} & 1.3_{d} \\ 2.1_{c} & 2.2_{e,f} & 2.3_{g} \\ 3.1_{d} & 3.2_{g} & 3.3_{h,i} \end{pmatrix}$$

with the fact that each of the 9 sub-signs or Cartesian products can appear in the following 4 forms

1. $(a.b)_{i,j}$ 3. $(b.a)_{i,j}$
2. $(a.b)_{j,i}$ 4. $(b.a)_{j,i}$

Therefore, on the basis of dyadic sub-signs, we get the following system of 4 basic semiotic forms

1. $Nm(a.b)_{i,j} = (a.b)_{i,j}$ (morphismic normal form)
2. $Nh(a.b)_{i,j} = (a.b)_{j,i}$ (heteromorphismic normal form)
3. $R(a.b)_{i,j} = (b.a)_{i,j}$ (reflection)
4. $D(a.b)_{i,j} = (b.a)_{j,i}$ (dualization)

2. However, if we intend to find out the basic semiotic forms for triadic sign relations (sign classes, reality thematics), we have to start with the abstract triadic sign relation, which can appear not only in 4, but in 12 outer forms:

(3.a 2.b 1.c)	(c.1 b.2 c.3)
(3.a 1.c 2.b)	(b.2 c.1 a.3)
(2.b 3.a 1.c)	(c.1 a.3 b.2)
(2.b 1.c 3.a)	(a.3 c.1 b.2)
(1.c 3.a 2.b)	(b.2 a.3 c.1)
(1.c 2.b 3.a)	(a.3 b.2 c.1)

With “outer forms”, we mean here the permutations of the normal form of the sign class in the left column, and the permutations of the normal form of the dualized sign class or reality thematic in the right column.

Now, since we are up to construct maximal systems, we start not from the 3-contextural, but from the 4-contextural 3-adic semiotic matrix (Kaehr 2008, p. 8):

$$\begin{pmatrix} 1.1_{a,bj} & 1.2_{c,j} & 1.3_{d,j} \\ 2.1_{c,j} & 2.2_{e,f,j} & 2.3_{g,j} \\ 3.1_{d,j} & 3.2_{g,j} & 3.3_{h,i,j} \end{pmatrix}$$

Since the maximal number of contextural indices is 3, realized in the main diagonal, we will, for the sake of simplicity, assume that that all sub-signs of a 4.-contextural 3-adic matrix can appear in the “inner” form ($a.b_{i,j,k}$), although we actually have for non-identitive morphisms (non-genuine or “mixed” sub-signs) k = ∅.

Under this assumption, each of the three sub-signs of a sign relation can thus appear in 6 forms. Since we are here only interested in homogeneous sign relations, we have the strong restriction that each combination of contextural indices must appear as the same for all sub-signs of a specific sign relation. (For heterogeneous combinations cf. Toth 2009.) Concretely, this means that each sign relation of the form (3.a 2.b 1.c) can appear in the 6 following forms

($3.a_{i,j,k}$ $2.b_{i,j,k}$ $1.c_{i,j,k}$)
($3.a_{i,k,j}$ $2.b_{i,k,j}$ $1.c_{i,k,j}$)
($3.a_{j,i,k}$ $2.b_{j,i,k}$ $1.c_{j,i,k}$)
($3.a_{j,k,i}$ $2.b_{j,k,i}$ $1.c_{j,k,i}$)
($3.a_{k,i,j}$ $2.b_{k,i,j}$ $1.c_{k,i,j}$)
($3.a_{k,i,j}$ $2.b_{k,i,j}$ $1.c_{k,i,j}$)

Together with the permutations without consideration of indices, we therefore obtain a maximal system of $6 \cdot 12 = 72$ basic homogeneous polycontextural sign relations for each of the 10 Peircean sign classes, totally 720 sign relations.

Bibliography

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