Interpretations of the kenomic matrix

Exercises to the topics of Poly-Change

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Abstract

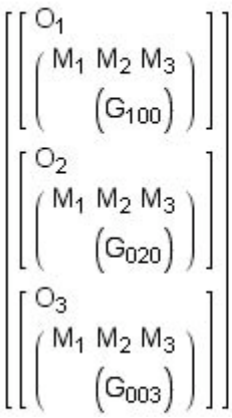
Examples for the exercises, § 5.2, of the recent article *"Poly-Change"* are given, concerning the logical, computational and semiotic interpretation of the kenomic matrix.
http://www.thinkartlab.com/pkl/lola/Polychange/Polychange.html

1. Exercises for matrices and brackets

1.1. Table and bracket notation for diagonal mxn-matrix

Table and bracket notation for diagonal 3 x3 – matrix

PM	O_1	O_2	O_3
M_1	$S_{1.1}$	–	–
M_2	–	$S_{2.2}$	–
M_3	–	–	$S_{3.3}$



dual presentation :

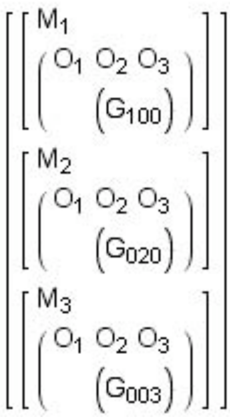


Table and bracket notation for diagonal 4 x4 – matrix

$$\left[\begin{array}{l}\left[\begin{array}{l}O_1\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\\ \qquad\left(G_{1000}\right)\end{array}\right)\end{array}\right]\\ \left[\begin{array}{l}O_2\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\\ \qquad\left(G_{0200}\right)\end{array}\right)\end{array}\right]\\ \left[\begin{array}{l}O_3\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\\ \qquad\left(G_{0030}\right)\end{array}\right)\end{array}\right]\\ \left[\begin{array}{l}O_4\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\\ \qquad\left(G_{0004}\right)\end{array}\right)\end{array}\right]\end{array}\right]$$

P M	O_1	O_2	O_3	O_4
M_1	$S_{1.1}$	–	–	–
M_2	–	$S_{2.2}$	–	–
M_3	–	–	$S_{3.3}$	–
M_4	–	–	–	$S_{4.4}$

Simplification

$$\left[\begin{array}{ll}\left[\begin{array}{l}O_1\\ \left(G_{1000}\right)\end{array}\right] & \left[\begin{array}{l}O_2\\ \left(G_{0200}\right)\end{array}\right]\\ \left[\begin{array}{l}O_3\\ \left(G_{0030}\right)\end{array}\right] & \left[\begin{array}{l}O_4\\ \left(G_{0004}\right)\end{array}\right]\end{array}\right]$$

1.2. Reflection

Bracket notation for reflectional change from 3 x3 to 5 x3 matrix

$$\left[\begin{array}{l}\left[\begin{array}{l}O_1\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\ M_5\\ \qquad\left(G_{11111}\right)\end{array}\right)\end{array}\right]\\ \left[\begin{array}{l}O_2\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\ M_5\\ \qquad\left(G_{22200}\right)\end{array}\right)\end{array}\right]\\ \left[\begin{array}{l}O_3\\ \left(\begin{array}{l}M_1\ M_2\ M_3\ M_4\ M_5\\ \qquad\left(G_{03303}\right)\end{array}\right)\end{array}\right]\end{array}\right]$$

P M	O_1	O_2	O_3
M_1	$S_{1.1}$	$S_{1.2}$	–
M_2	$S_{2.1}$	$S_{2.2}$	$S_{2.3}$
M_3	$S_{3.1}$	$S_{3.2}$	$S_{3.3}$
M_4	$S_{4.1}$	–	–
M_5	$S_{5.1}$	–	$S_{5.3}$

Bracket notation for reflectional / replicational change from 3 x3 to 3 x3 matrix

$$\left[\left[O_1 \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{110}) \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{110}) \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{110}) \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{100}) \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{pmatrix}\right] \left[O_2 \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{222}) \end{pmatrix}\right] \left[O_3 \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{033}) \end{pmatrix}\right]\right]$$

P M	O_1	O_2	O_3
M_1	$S_{1.1\ .1\ .1\ .1}$	$S_{1.2}$	$\emptyset$
M_2	$S_{2.1\ .1\ .1}$	$S_{2.2}$	$S_{2.3}$
M_3	$\emptyset$	$S_{3.2}$	$S_{3.3}$

Bracket notation for reflectional / replicational change for 5 x3

$$\left[\left[O_1 \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{1.1\ .1\ .1\ .1}) \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{10000}) \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{10110}) \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{10000}) \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{11111}) \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{pmatrix}\right] \left[O_2 \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{22200}) \end{pmatrix}\right] \left[O_3 \begin{pmatrix} M_1\ M_2\ M_3\ M_4\ M_5 \\ (G_{03303}) \end{pmatrix}\right]\right]$$

P M	O_1	O_2	O_3
M_1	$S_{1.1\ .1\ .1\ .1}$	$S_{1.2}$	–
M_2	$S_{2.1}$	$S_{2.2}$	$S_{2.3}$
M_3	$S_{3.1\ .1}$	$S_{3.2}$	$S_{3.3}$
M_4	$S_{4.1}$	–	–
M_5	$S_{5.1\ .1\ .1\ .1}$	–	$S_{5.3}$

Alternative notation for reflectional / replicational change for 5 x3

$$\left[\begin{matrix}\left[\begin{matrix}O_1\\ \left(\begin{matrix}M^{(5)}\\ (G_{1.1.1.1.1})\\ \left(\begin{matrix}M^{(5)}\\ (G_{10000})\\ \left(\begin{matrix}M^{(5)}\\ (G_{10110})\\ \left(\begin{matrix}M^{(5)}\\ (G_{10000})\\ \left(\begin{matrix}M^{(5)}\\ (G_{11111})\end{matrix}\right)\end{matrix}\right)\end{matrix}\right)\end{matrix}\right)\end{matrix}\right)\end{matrix}\right]\\ \left[\begin{matrix}O_2\\ \left(\begin{matrix}M^{(5)}\\ (G_{22200})\end{matrix}\right)\end{matrix}\right]\left[\begin{matrix}O_3\\ \left(\begin{matrix}M^{(5)}\\ (G_{03303})\end{matrix}\right)\end{matrix}\right]\end{matrix}\right]$$

1.3. Interaction

Bracket notation for interactional change for 3 x3

$$\left[\begin{matrix}\left[\begin{matrix}O_1\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{100})\\ \left[\begin{matrix}O_2\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{020})\\ \left[\begin{matrix}O_3\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{003})\end{matrix}\right)\end{matrix}\right]\end{matrix}\right)\end{matrix}\right]\end{matrix}\right)\end{matrix}\right]\\ \left[\begin{matrix}O_2\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{020})\end{matrix}\right)\end{matrix}\right]\left[\begin{matrix}O_3\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{003})\end{matrix}\right)\end{matrix}\right]\end{matrix}\right]$$

[bif, id, id]	O_1	O_2	O_3
M_1	$S_{1.1}$	x	x
M_2	$S_{2.1}$	$S_{2.2}$	x
M_3	$S_{3.1}$	x	$S_{3.3}$

Bracket notation for interactional and reflectional / replicational change to 3 x3

$$\left[\begin{matrix}\left[\begin{matrix}O_1\\ \left[\begin{matrix}O_1\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{110})\left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{110})\left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{110})\left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{100})\end{matrix}\right)\end{matrix}\right)\end{matrix}\right)\end{matrix}\right)\end{matrix}\right]\\ \left[\begin{matrix}O_2\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{020})\end{matrix}\right)\\ \left[\begin{matrix}O_3\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{003})\end{matrix}\right)\end{matrix}\right]\end{matrix}\right]\end{matrix}\right]\\ \left[\begin{matrix}O_2\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{020})\end{matrix}\right)\end{matrix}\right]\left[\begin{matrix}O_3\\ \left(\begin{matrix}M_1\ M_2\ M_3\\ (G_{003})\end{matrix}\right)\end{matrix}\right]\end{matrix}\right]$$

[bif, id, id]	O_1	O_2	O_3
M_1	$S_{1.1\ .1\ .1}$	x	x
M_2	$S_{2.1}$	$S_{2.2}$	x
M_3	$S_{3.1}$	x	$S_{3.3}$

Bracket notation for interactional and reflectional / replicational change to 4 x5

[ ]	O_1	O_2	O_3	O_4	O_5
M_1	$S_{1.1\ .1\ .1}$	–	–	$S_{1.4}$	□
M_2	$S_{5.1}$	$S_{2.2}$	–	–	$S_{2.5}$
M_3	$S_{4.1}$	–	$S_{3.3}$	–	–
M_4	$S_{3.1}$	$S_{2.4}$	–	$S_{4.4}$	$S_{4.5}$

$$\begin{bmatrix}
\text{repl}_1^{1.2.3.4}\left(\text{iter}_2^{2.4}\left(\text{id}_3^3\left(\text{iter}_4^{1.4}\left(\text{iter}_5^{2.4}\left(\left[MO^{(4,5)}\right]\right)\right)\right)\right)\right) \\
\begin{bmatrix}
O_1 \\
\begin{bmatrix} O_1 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{1000}) \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{1000}) \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{1000}) \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{1000}) \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{bmatrix} \\
\begin{bmatrix} O_5 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{0500}) \end{pmatrix} \end{bmatrix} \begin{bmatrix} O_4 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{0040}) \end{pmatrix} \end{bmatrix} \\
\begin{bmatrix} O_3 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{0003}) \end{pmatrix} \end{bmatrix}
\end{bmatrix} \\
\begin{bmatrix} O_2 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{0202}) \end{pmatrix} \end{bmatrix} \begin{bmatrix} O_3 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{0030}) \end{pmatrix} \end{bmatrix} \\
\begin{bmatrix} O_4 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{4004}) \end{pmatrix} \end{bmatrix} \begin{bmatrix} O_5 \\ \begin{pmatrix} M_1\;M_2\;M_3\;M_4 \\ (G_{0505}) \end{pmatrix} \end{bmatrix}
\end{bmatrix}$$

1.4. Interplay between interactionality and reflectionality

Mixing freely reflectional and interactional pattern are leading to local iterations and recursions of the general scheme producing a fractalization of the general scheme.

The examples shows:

At the locus O_2 we have a full reflection G_{222} and an interaction from the locus O_1 into the locus O_2 producing additionally to G_{222} at O_2 the interactional pattern G_{100} and an interaction from the locus O_3 into the locus O_2 producing the interactional pattern G_{003}.

Hence, the whole reflectional/interactional pattern of the example is: [G_{111}, $G_{222/003/100}$, G_{033}].

$$\begin{bmatrix} \begin{bmatrix} O_1 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{111}) \end{pmatrix} \end{bmatrix} \\ \begin{bmatrix} O_2 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ \begin{bmatrix} O_1 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{100}) \end{pmatrix} \end{bmatrix} \\ \begin{bmatrix} O_3 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{003}) \end{pmatrix} \end{bmatrix} \end{pmatrix} \\ (G_{222}) \end{bmatrix} \\ \begin{bmatrix} O_3 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{033}) \end{pmatrix} \end{bmatrix} \end{bmatrix}$$

[ ]	O_1	O_2	O_3
M_1	$S_{1.1}$	$S_{2.1.1}$	–
M_2	$S_{2.1}$	$S_{2.2.0}$	$S_{3.2}$
M_3	$S_{3.1}$	$S_{2.3.3}$	$S_{3.3}$

Interplay between interactionality, reflectionality and replicativity

Additional to the example above for interactionality and reflectionality, a pattern of *replicativity* or introspection is involved at O_1 with $G_{1.1.1.1.1}$ for M_1 and $G_{2.1.1.1}$ for M_2.

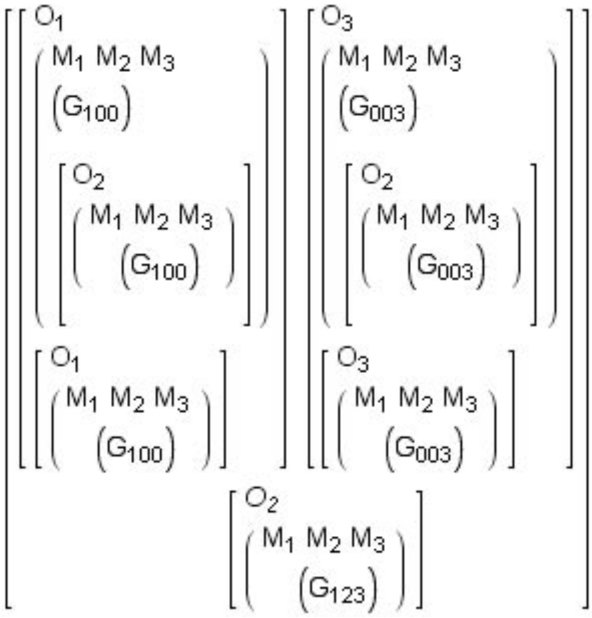
$$\begin{bmatrix} \begin{bmatrix} O_1 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{110}) \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{110}) \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{110}) \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{100}) \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{pmatrix} \end{bmatrix} \\ \begin{bmatrix} O_2 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ \begin{bmatrix} O_1 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{100}) \end{pmatrix} \end{bmatrix} \\ \begin{bmatrix} O_3 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{003}) \end{pmatrix} \end{bmatrix} \end{pmatrix} \\ (G_{222}) \end{bmatrix} \\ \begin{bmatrix} O_3 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (G_{033}) \end{pmatrix} \end{bmatrix} \end{bmatrix}$$

[ ]	O_1	O_2	O_3
M_1	$S_{1.1.1.1.1}$	$S_{2.1.1}$	–
M_2	$S_{2.1.1.1}$	$S_{2.2.0}$	$S_{3.2}$
M_3	$S_{1.3}$	$S_{2.3.3}$	$S_{3.3}$

1.5. Permutations

Permutative patterns, produced by the super-operator *perm*, are behind those visits to other systems and back to the start again. The journey might start simultaneously in $system_1$ and $system_3$, both visiting $system_2$ at their offered locations, and back again.

The table represents more the static pattern, while the bracket notation the dynamics of this permutation.



[perm, id, perm]	O_1	O_2	O_3
M_1	$S_{1.1}$	$S_{2.1}$	–
M_2	–	$S_{2.2}$	–
M_3	–	$S_{2.3}$	$S_{3.3}$

2. Logical interpretations

2.1. The kenomic matrix and polycontextural functions

The importance of the kenomic matrix for the interpretation and organization of polycontextural functions has to be emphasized. The classical treatment of polycontextural logical functions is based on set-theoretic functions and their decomposition, i.e. interpretation.

In this exercise of mapping logical systems onto the kenomic matrix, only *bi-valent* (dyadic, dichotomic, dual) logical systems are involved. As it is shown for semiotic systems, arbitrary *contextural bases* of dyadic, triadic and tetradic up to n-adic bases have to be considered. In the literature there is nearly nothing to read about the distribution mechanisms for genuine triadic m-contextural logical systems. First combinatorial concepts occur, nevertheless as early as 1962 in Na' s work.

Super – operators for the mapping of logical systems onto the matrix

$$\text{Logic}^{(m)}: \left[\text{Logic}^{(m)}\right]_{\text{refl, act}} \xrightarrow[\text{sops}]{} \left[\text{Logic}^{(m)}\right]_{\text{refl, act}}$$

$$\text{sops} = \{\text{id, perm, red, bif, repl}\}$$

$$\textbf{id}: \forall\, i, j \in s(m): \quad \left(\text{Logic}^{i,j}\right) \xrightarrow[\text{id}]{} \left(\text{Logic}^{i,j}\right)$$

$$\textbf{perm}(i, j): \forall\, i, j \in s(m): \left(\text{Logic}^{i}, \text{Logic}^{j}\right) \xrightarrow[\text{perm}]{} \left(\text{Logic}^{j}, \text{Logic}^{i}\right)$$

$$\textbf{red}(i, j): \forall\, i, j \in s(m): \left(\text{Logic}^{i}, \text{Logic}^{j}\right) \xrightarrow[\text{red}]{} \left(\text{Logic}^{i}, \text{Logic}^{i}\right)$$

$$\textbf{bif}(i, j): \forall\, i, j \in s(m): \left(\text{Logic}^{i}, \text{Logic}^{j}\right) \xrightarrow[\text{bif}]{} \left(\left(\text{Logic}^{i} \,\|\, \text{Logic}^{j}\right), \text{Logic}^{j}\right)$$

$$\textbf{repl}(i, j): \forall\, i, j \in s(m): \left(\text{Logic}^{i}, \text{Logic}^{j}\right) \xrightarrow[\text{repl}]{} \left(\left(\text{Logic}^{i} \,|\, \text{Logic}^{i}\right), \text{Logic}^{j}\right)$$

2.1.1. Positions

Positioning or placing (Setzung), realized by the super-operator *id* (identity), is well studied in the polycontextural literature. But it is only applicable to a very small set of constellations. They have a natural interpretation by the main diagonal of the kenomic matrix, which is also producing the matching conditions MC.
Conjunctions and disjunctions as introduced by Gunther and their DeMorgan formulas are typical. But it is working for balanced negational systems only.

Examples of the positional mapping of junctions

$$\text{pattern}: [\text{id}, \text{id}, \text{id}]$$

$$(\text{JJJ}): L^{(3)} * L^{(3)} \longrightarrow L^{(3)}: [L_1, L_2, L_3]$$

$$\begin{bmatrix} \text{Log}_1 : L_1 * L_1 \xrightarrow[\text{junct } J]{} L_1 \\ \text{Log}_2 : L_2 * L_2 \xrightarrow[\text{junct } J]{} L_2 \\ \text{Log}_3 : L_3 * L_3 \xrightarrow[\text{junct } J]{} L_3 \end{bmatrix}, \quad \left[\begin{matrix} \left[\begin{matrix} O_1 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (\text{Log}_{100}) \end{pmatrix} \end{matrix}\right] \\ \left[\begin{matrix} O_2 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (\text{Log}_{020}) \end{pmatrix} \end{matrix}\right] \\ \left[\begin{matrix} O_3 \\ \begin{pmatrix} M_1\ M_2\ M_3 \\ (\text{Log}_{003}) \end{pmatrix} \end{matrix}\right] \end{matrix}\right]$$

[JJJ]	O_1	O_2	O_3
M_1	J	–	–
M_2	–	J	–
M_3	–	–	J

$$J = \{\wedge, \vee\}$$

$$\frac{t_1\ X \wedge\wedge\wedge\ Y}{\begin{matrix} t_1\ X \\ t_1\ Y \end{matrix}} \quad \frac{f_1\ X \wedge\wedge\wedge\ Y}{f_1\ X \mid f_1\ Y} \quad \frac{t_1\ X \vee\wedge\vee\ Y}{t_1\ X \mid t_1\ Y} \quad \frac{f_1\ X \vee\wedge\vee\ Y}{\begin{matrix} f_1\ X \\ f_1\ Y \end{matrix}}$$

$$\frac{t_2\ X \wedge\wedge\wedge\ Y}{\begin{matrix} t_2\ X \\ t_2\ Y \end{matrix}} \quad \frac{f_2\ X \wedge\wedge\wedge\ Y}{f_2\ X \mid f_2\ Y} \quad \frac{t_2\ X \vee\wedge\vee\ Y}{\begin{matrix} t_2\ X \\ t_2\ Y \end{matrix}} \quad \frac{f_2\ X \vee\wedge\vee\ Y}{f_2\ X \mid f_2\ Y}$$

$$\frac{t_3\ X \wedge\wedge\wedge\ Y}{\begin{matrix} t_3\ X \\ t_3\ Y \end{matrix}} \quad \frac{f_3\ X \wedge\wedge\wedge\ Y}{f_3\ X \mid f_3\ Y} \quad \frac{t_3\ X \vee\wedge\vee\ Y}{t_3\ X \mid t_3\ Y} \quad \frac{f_3\ X \vee\wedge\vee\ Y}{\begin{matrix} f_3\ X \\ f_3\ Y \end{matrix}}$$

2.1.2. Interactions

First concepts of logical interactions goes back to Gunther's morphogrammatic *transjunctions* (1962).

Example for the bifurcational mapping of transjunctions

pattern: $[\text{bif, id, id}]$

$$(<> \vee \vee): L^{(3)} * L^{(3)} \longrightarrow L^{(3)}: [L_1, (L_2 \| L_1), (L_3 \| L_1)]$$

$$\left[\begin{array}{l} \text{Log}_1 : L_1 * L_1 \xrightarrow[\text{transjunct } <>]{} L_1 : \begin{cases} f_1 * t_1,\ t_1 * f_1 \longrightarrow f_2,\ f_3 \\ t_1 * t_1 \longrightarrow t_1,\ t_3 \\ f_1 * f_1 \longrightarrow f_1,\ t_2 \end{cases} \\ \text{Log}_2 : L_2 * L_2 \xrightarrow[\text{conjunction}]{} L_2 \| L_1 \\ \text{Log}_3 : L_3 * L_3 \xrightarrow[\text{conjunction}]{} L_3 \| L_1 \end{array}\right.$$

[<> ∨ ∨]	O_1	O_2	O_3
M_1	trans	trans	trans
M_2	–	and	–
M_3	–	–	and

$$\frac{t_1\ X\ <> \vee \vee\ Y}{\begin{array}{c} t_1\ X \\ t_1\ Y \end{array}} \qquad \frac{f_1\ X\ <> \vee \vee\ Y}{\begin{array}{c} f_1\ X \\ f_1\ Y \end{array}}$$

$$\frac{t_2\ X\ <> \vee \vee\ Y}{\begin{array}{c|c} t_2\ X & f_1\ X \\ t_2\ Y & f_1\ Y \end{array}} \qquad \frac{f_2\ X\ <> \vee \vee\ Y}{f_2\ X \mid f_2\ Y \ \Big\| \begin{array}{c|c} f_1\ X & t_1\ X \\ t_1\ Y & f_1\ Y \end{array}}$$

$$\frac{t_3\ X\ <> \vee \vee\ Y}{\begin{array}{c} t_3\ X \\ t_3\ Y \end{array} \Big\| \begin{array}{c} t_1\ X \\ t_1\ Y \end{array}} \qquad \frac{f_3\ X\ <> \vee \vee\ Y}{f_3\ X \mid f_3\ Y \ \Big\| \begin{array}{c|c} f_1\ X & t_1\ X \\ t_1\ Y & f_1\ Y \end{array}}$$

2.1.3. Reflections

Reflectional patterns appeared first as interpretations of implicational constellations they might be modeled as reductions.

What's the kenomic matrix for?
"It wasn't unknown to Gunther that there is a little problem of distribution/mediation which needs a special explanation. Gunther's solution insisted correctly that the value-sequence of sub-system S_3 is still a *disjunction* because it is based in the morphogram [1] for disjunction. But it was slightly shifted to a value-sequences corresponding to a value-sequence of sub-system S_1. To solve this point, an *interpretation* was introduced: it was called a *disjunctive disjunction*. Such *interpretative* solutions had been widely used to justify logical functions in place-valued logics. But they are in no way operational.
In polylogical systems such problems are solved naturally by distribution over the *polycontextural matrix."*

Example for the reductional mapping of junctions

pattern: $\left[\text{id, id, red}\right]$

$$(\vee \longrightarrow \vee): L^{(3)} * L^{(3)} \longrightarrow L^{(3)}: \left[(L_1 \mid L_3),\ L_2,\ \emptyset\right]$$

$$\left[\begin{array}{l} \text{Log}_1 : L_1 * L_1 \xrightarrow[\text{disjunction } \vee]{} L_1 \\ \text{Log}_2 : L_2 * L_2 \xrightarrow[\text{imlication } \longrightarrow]{} L_2 \\ \text{Log}_3 : L_3 * L_3 \xrightarrow[\text{disjunction } \vee]{} L_1 \end{array}\right.$$

$[\vee \longrightarrow \vee]$	O_1	O_2	O_3
M_1	or	–	–
M_2	–	impl	–
M_3	or	–	–

$$\frac{t_1\ X \vee \longrightarrow \vee\ Y}{f_1\ X \mid f_1\ Y \,\|\, f_3\ X \mid f_3\ Y} \qquad \frac{f_1\ X \vee \longrightarrow \vee\ Y}{\begin{array}{c|c} f_1\ X & f_3\ X \\ f_1\ Y & f_3\ Y \end{array}}$$

$$\frac{t_2\ X \vee \longrightarrow \vee\ Y}{f_2\ X \mid t_2\ Y} \qquad \frac{f_2\ X \vee \longrightarrow \vee\ Y}{\begin{array}{c} t_2\ X \\ f_2\ Y \end{array}}$$

2.1.4. Replications

Replicative constellations don't have an appearance in polycontextural logics as it was sketched by Gunther. It seems that replications don't have a direct representation in 'propositional' polycontextural logic. They might have a natural interpretation on a quantificational meta-level.
An example might be a 'quotational' system as a kind of intrinsic introspections. Represented as tables, replications are introducing an additional dimension to the 2-dimensional tabular structure.

3. Computational interpretations

3.1. General scheme of ConTeXtures

$$\textit{sketch} - \text{horizon}^{(m,n)}$$
$$\left[\begin{array}{l} \textit{build} - \text{architectures} \\ \left[\begin{array}{l} \textit{thematize} - \text{szenario} \\ \left[\begin{array}{l} \textit{identify} - \text{contextures} \\ \left(\begin{array}{l} \textit{define} - \text{operations} \\ \left(\begin{array}{l} \textit{abstract} - \text{functions} \\ \left\{\textit{propose} - \text{statements}\right\} \end{array}\right) \end{array}\right) \end{array}\right] \end{array}\right] \end{array}\right]$$

3.2. Different modi of replication

Replication into the ' name – space ' of a contexture

$\text{samba}^{(3,3)}(\text{repl, id, id})$ – horizon

$$\begin{bmatrix} \text{thematize (topics}^{(3)}) & & \\ \begin{bmatrix} \text{identify contextures}_{1.1} \\ \begin{bmatrix} \text{define name} \\ \begin{bmatrix} \begin{pmatrix} \text{lambda}_{1.1} \\ \{\text{statements}\} \end{pmatrix} \\ \begin{pmatrix} \text{lambda}_{1.2} \\ \{\text{statements}\} \end{pmatrix} \\ \begin{pmatrix} \text{lambda}_{1.3} \\ \{\text{statements}\} \end{pmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} & \begin{bmatrix} \text{identify contexture}_{2.2} \\ \begin{pmatrix} \text{define name} \\ \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{pmatrix} \end{bmatrix} & \begin{matrix} \emptyset \\ \emptyset \\ \begin{bmatrix} \text{identify contexture}_{3.3} \\ \begin{pmatrix} \text{define name} \\ \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{pmatrix} \end{bmatrix} \end{matrix} \end{bmatrix}$$

Replication of a name into a contexture

$\text{samba}^{(3,4)}(\text{repl, id, id})$ – horizon

$$\begin{bmatrix} \text{thematize (topics}^{(3)}) & & \\ \begin{bmatrix} \text{identify contextures}_{1.1} \\ \begin{bmatrix} \text{define name}_{1.1} \\ \begin{bmatrix} \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{bmatrix} \end{bmatrix} \\ \begin{bmatrix} \text{define name}_{1.2} \\ \begin{bmatrix} \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{bmatrix} \end{bmatrix} \\ \begin{bmatrix} \text{define name}_{1.3} \\ \begin{bmatrix} \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{bmatrix} \end{bmatrix} \\ \begin{bmatrix} \text{define name}_{1.4} \\ \begin{bmatrix} \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} & \begin{bmatrix} \text{identify contexture}_{2.2} \\ \begin{pmatrix} \text{define name} \\ \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{pmatrix} \end{bmatrix} & \begin{matrix} \emptyset \\ \emptyset \\ \begin{bmatrix} \text{identify contexture}_{3.3} \\ \begin{pmatrix} \text{define name} \\ \begin{pmatrix} \text{lambda} \\ \{\text{statements}\} \end{pmatrix} \end{pmatrix} \end{bmatrix} \end{matrix} \end{bmatrix}$$

Null

Replication of a contexture into itself at an elected locus

This kind of replication of *a* contexture changes into an *iterative* reflection.

```
samba^(3)(repl, id, id) – horizon
[thematize (topics^(3))
 [identify locus_1.1
  [[identify contexture_1.1
     [define name
      (lambda
       ({statements}))]]
                                                         Ø
   [identify contexture_1.2          [identify contexture_2.2       Ø
     [define name                      [define name
      (lambda                           (lambda                  [identify contexture_3.3
       ({statements}))]]                 ({statements}))]]          [define name
                                                                     (lambda
   [identify contexture_1.3                                           ({statements}))]]
     [define name
      (lambda
       ({statements}))]]]]
```

3.3. Mediators

"In a more generous setting the systems can be distributed over a network, say Internet, and mediators similar to compilers would have to mediate the distributed programming on mediated poly-processor computing systems. Mediators *would have to parse the different programming approaches in respect to their* mediability. *That is, conditions of mediation would have to be checked, optimized and debugged. Thus, the chain of realization from programing to compiling has first to be augmented by a system of mediation. The new paradigm of realization now is* programming-mediating-compiling *in distributed and mediated programming languages."*

4. Semiotic interpretations

4.1. Positions

Positioning (Setzung) semiotic systems isn't well studied in the polycontextural literature.

Nevertheless, semiotics, i.e. semiotic systems, like Peirce-Bense-Toth systems, might naturally be distributed and mediated over the kenomic matrix. Classical semiotics is distributed, *per se*, over a single kenomic locus which isn't accessible to semiotics by semiotic means.

The examples for the exercises shows two sorts of modelings of the kenomic position matrix: a distribution of mediated semiotic *dyads* and a distribution of mediated semiotic *triads*.

In the *first* case, triadic-trichotomic semiotics, i.e. the matrix of sign classes, is understood as a mediation of dyads. The decomposition of the Peircean triads into mono-contextural dyads corresponds to the Bensean interpretation of semiotics and its semiotic Cartesian matrix.

Bense' s approach is not including a mediation of the dyads neither a contextural interpretation of the dyads. The dyads are composed by some set- or category theoretical operations. A mediative interpretation would automatically lead to a kind of a place-valued system for semiotics and inherit all its formal problems.
Mediation of dyads in the sense of polycontexturality was introduced by my own papers and published recently at this place.

The *second* case is distributing and mediating full *triads* over the kenomic matrix. Hence, the mediation is concerned with triads and not with their internal structure, i.e. dyads, like the first example. This example of a different modeling, is mirrored by the different indexes involved.

Epistemological cuts
The decision to chose an epistemological paradigm of arbitrary complexity should be free. Unfortunately, there are only a few accessible. There is no special need to believe in dyads, triads tetrads, etc. or in monads. The question is, does it work? It works for dyads. It rarely works for triads. And there is no accepted formalism for tetrads. Obviously, n-adic relations of algebraic relation theory and relational logic are based on dyads, and their n-ads are always reducible to dyads. What's lost with this manoeuvre isn't told in general.

"To iterate is human ... but to recurse is divine." (Alfred Inselberg)
Hence, to di(s)rempt must be devilish?

Therefore, it should be a question of a free decision to develop semiotics as founded in dyads, triads or tetrads, or generally in non-reducible n-ads.

To go further with this **exercise**, study the paper *"Transjunctional semiotics"*.

4.1.1. Triadic semiotics as mediations of dyads

What does it mean to choose a triadic foundation of semiotics?
As sketched before, triadicity as a mediation of dyads, hence, has to be realized on all levels of thematization. That is, a triadic matrix alone doesn't mean much if it is not based simultaneously on all needed triadic formal systems, like logics, arithmetic, category theory, etc.
On the other hand, the mechanism of *mediation* of dyads has not to stop with the construction of triads. All kind of n-ads, based on mediated dyads, might be constructed.

Table notation

PM	O_1	O_2	O_3
M_1	$Sem_{1.1}$	–	–
M_2	–	$Sem_{2.2}$	–
M_3	–	–	$Sem_{3.3}$

Bracket notation

$$\left[\begin{array}{l} \left[\begin{array}{l} O_1 \\ \left(\begin{array}{l} M_1\, M_2\, M_3 \\ \quad \left(Sem_{100}\right) \end{array}\right) \end{array}\right] \\ \left[\begin{array}{l} O_2 \\ \left(\begin{array}{l} M_1\, M_2\, M_3 \\ \quad \left(Sem_{020}\right) \end{array}\right) \end{array}\right] \\ \left[\begin{array}{l} O_3 \\ \left(\begin{array}{l} M_1\, M_2\, M_3 \\ \quad \left(Sem_{003}\right) \end{array}\right) \end{array}\right] \end{array}\right]$$

Scheme of $\mathrm{Sem}^{(3,2)}$:

$$\mathrm{Semiotics}^{(3,2)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.2)_{1} & \longrightarrow & (1.3)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (2.1)_{1} & \longrightarrow & (2.2)_{1.2} & \longrightarrow & (2.3)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (3.1)_{3} & \longrightarrow & (3.2)_{2} & \longrightarrow & (3.3)_{2.3} \end{bmatrix}$$

Sub – system decomposition of $\mathrm{Sem}^{(3,2)}$:

$$\mathrm{sub-system}_1 = \begin{bmatrix} (1.1) \longrightarrow & (1.2) \\ \downarrow \quad x & \downarrow \\ (2.1) \longrightarrow & (2.2) \end{bmatrix}$$

$$\mathrm{sub-system}_2 = \begin{bmatrix} (2.2) \longrightarrow & (2.3) \\ \downarrow \quad x & \downarrow \\ (3.2) \longrightarrow & (3.3) \end{bmatrix}$$

$$\mathrm{sub-system}_3 = \begin{bmatrix} (1.1) \longrightarrow & (1.3) \\ \downarrow \quad x & \downarrow \\ (3.1) \longrightarrow & (3.3) \end{bmatrix}$$

Positions

3 – contextural semiotic matrix

$$\mathrm{Sem}^{(3,2)} = \begin{pmatrix} MM & .1_{1.3} & .2_{1.2} & .3_{2.3} \\ 1_{1.3} & \mathbf{1.1_{1.3}} & \mathbf{1.2_{1}} & \mathbf{1.3_{3}} \\ 2_{1.2} & \mathbf{2.1_{1}} & \mathbf{2.2_{1.2}} & \mathbf{2.3_{2}} \\ 3_{2.3} & \mathbf{3.1_{3}} & \mathbf{3.2_{2}} & \mathbf{3.3_{2.3}} \end{pmatrix}$$

Reflections

3 – contextural semiotic matrix [id, red, id]

$$\mathrm{Sem}^{(3,2)}_{[id,red,id]} = \begin{pmatrix} MM & .1_{1.3} & .2_{1.2} & .3_{2.3} \\ 1_{1.3} & \mathbf{1.1_{1.3}} & \mathbf{1.2_{1}} & \mathbf{1.3_{3}} \\ 2_{1.2} & \mathbf{2.1_{1}} & \mathbf{2.2_{1.1}} & \mathbf{1.2_{1}} \\ 3_{2.3} & \mathbf{3.1_{3}} & \mathbf{2.1_{1}} & \mathbf{1.1_{1.3}} \end{pmatrix}$$

Interactions

3 – contextural semiotic matrix [bif, id, id]

$$\mathrm{Sem}^{(3,2,2)}_{(bif,\, id,\, id)} = \begin{pmatrix} [\blacklozenge, \circ, \circ] & 1 & 2 & 3 \\ 1 & \mathbf{1.1}_{1.3} & \mathbf{2.3}_{2.3} & \mathbf{1.3}_{3} \\ 2 & \mathbf{3.2}_{2.3} & \mathbf{2.2}_{1.2} & \mathbf{2.3}_{2} \\ 3 & \mathbf{3.1}_{3} & \mathbf{3.2}_{2} & \mathbf{3.3}_{2.3} \end{pmatrix}$$

Replications

3 – contextural semiotic matrix [repl, id, id]

$$\mathrm{Sem}^{(3,2,2)}_{(repl,\, id,\, id)} = \begin{pmatrix} MM & .1_{1.3} & .2_{1.2} & .3_{2.3} \\ 1_{1.3} & \mathbf{1.1}_{1.1.3} & \mathbf{1.2}_{1.1} & \mathbf{1.3}_{3} \\ 2_{1.2} & \mathbf{2.1}_{1.1} & \mathbf{2.2}_{1.1.2} & \mathbf{2.3}_{2} \\ 3_{2.3} & \mathbf{3.1}_{3} & \mathbf{3.2}_{2} & \mathbf{3.3}_{2.3} \end{pmatrix}$$

4.1.2. Tetradic semiotics as mediations of dyads

Positions

4 – contextural 2 – semiotic matrix

$$\mathrm{Sem}^{(4,2,3)} = \begin{pmatrix} MM & 1 & 2 & 3 & 4 \\ 1 & 1.1_{1.3.6} & 1.2_{1} & 1.3_{3} & 1.4_{6} \\ 2 & 2.1_{1} & 2.2_{1.2.5} & 2.3_{2} & 2.4_{5} \\ 3 & 3.1_{3} & 3.2_{2} & 3.3_{2.3.4} & 3.4_{4} \\ 4 & 4.1_{6} & 4.2_{5} & 4.3_{4} & 4.4_{4.5.6} \end{pmatrix}$$

$$\mathrm{val}\left(\mathrm{Sem}^{(4,1,2)} \times \mathrm{Sem}^{(4,1,2)}\right) =$$

$$(1_{1.3.6},\ 2_{1.2.5},\ 3_{2.3.4},\ 4_{4.5.6}) \times (1_{1.3.6},\ 2_{1.2.5},\ 3_{2.3.4},\ 4_{4.5.6})$$

with:

$$\mathrm{val}\left(\mathrm{Sem}^{1} \times \mathrm{Sem}^{1}\right) = (1, 2)_1 \times (1, 2)_1$$

$$\mathrm{val}\left(\mathrm{Sem}^{2} \times \mathrm{Sem}^{2}\right) = (2, 3)_2 \times (2, 3)_2$$

$$\mathrm{val}\left(\mathrm{Sem}^{3} \times \mathrm{Sem}^{3}\right) = (1, 3)_3 \times (1, 3)_3$$

$$\mathrm{val}\left(\mathrm{Sem}^{4} \times \mathrm{Sem}^{4}\right) = (3, 4)_4 \times (3, 4)_4$$

$$\mathrm{val}\left(\mathrm{Sem}^{5} \times \mathrm{Sem}^{5}\right) = (2, 4)_5 \times (2, 4)_5$$

$$\mathrm{val}\left(\mathrm{Sem}^{6} \times \mathrm{Sem}^{6}\right) = (1, 4)_6 \times (1, 4)_6.$$

4.1.3. Pentadic semiotics as mediations of triads

As an example we shall study the mediation of two triadic-trichotomic semiotic basic systems, Sem^1 and Sem^2. Both semiotic systems are not decomposed into dyadic relations but kept together as triadic systems. A 'concatenational' composition of two genuine triadic systems results in a pentadic semiotic system as much as a 'concatenational' composition of dyads results in a composed triad.

With the composition formula:
$compl(Sem^{(5,3)}) = compl(Sem^1 \otimes Sem^2) = compl(Sem^1) + compl(Sem^2) - 1$,
hence: 3+3-1=5.

$$Sem^1 = \begin{bmatrix} 1.1_1 & 1.2_1 & 1.3_1 \\ 2.1_1 & 2.2_1 & 2.3_1 \\ 3.1_1 & 3.2_1 & 3.3_1 \end{bmatrix}, \quad Sem^2 = \begin{bmatrix} 3.3_2 & 3.4_2 & 3.5_2 \\ 4.3_2 & 4.4_2 & 4.5_2 \\ 5.3_2 & 5.4_2 & 5.5_2 \end{bmatrix}$$

$$Sem^{(5,3,2)} = \begin{bmatrix} MM & 1 & 2 & 3 & 4 & 5 \\ 1 & 1.1 & 1.2 & 1.3 & 1.4 & 1.5 \\ 2 & 2.1 & 2.2 & 2.3 & 2.4 & 2.5 \\ 3 & 3.1 & 3.2 & 3.3 & 3.4 & 3.5 \\ 4 & 4.1 & 4.2 & 4.3 & 4.4 & 4.5 \\ 5 & 5.1 & 5.2 & 5.3 & 5.4 & 5.5 \end{bmatrix}$$

The sub – system indices of the matrix values are omitted.

$$\textbf{Partions}_{(5,3)} = \left\{ \begin{array}{c} (1, 2, 3), (3, 4, 5), \\ (1, 2, 4), (1, 2, 5), (1, 3, 4), (1, 3, 5), (1, 4, 5), \\ (2, 3, 4), (2, 3, 5), (2, 4, 5) \end{array} \right\}$$

Sign class subsystems

$SR^1 = (1, 2, 3)$, $SR^2 = (3, 4, 5)$,

$SR^3 = (1, 2, 4)$, $SR^4 = (1, 2, 5)$, $SR^5 = (1, 3, 4)$, $SR^6 = (1, 3, 5)$, $SR^7 = (1, 4, 5)$

$SR^8 = (2, 3, 4)$, $SR^9 = (2, 3, 5)$, $SR^{10} = (2, 4, 5)$.

Mediation Conditions MC

$$MC(SR^1 \otimes SR^2) = \{3.3_1 \equiv 3.3_2\}$$

$$MC(SR^3 \otimes SR^4 \otimes SR^5 \otimes SR^6 \otimes SR^7) = \left\{ \begin{array}{c} 1.1_3 \equiv 1.1_4 \equiv 1.1_5 \equiv 1.1_6 \equiv 1.1_7, \\ 4.4_3 \equiv 4.4_5, \\ 5.5_4 \equiv 5.5_6 \equiv 5.5_7 \end{array} \right\}$$

$$MC(SR^8 \otimes SR^9 \otimes SR^{10}) = \left\{ \begin{array}{c} 2.2_8 \equiv 2.2_9 \equiv 2.2_{10} \\ 5.5_9 \equiv 5.5_{10} \\ 4.4_8 \equiv 4.4_3 \equiv 4.4_{5,} \end{array} \right\}$$

$$MC(SR^{(5)}) = \left\{ \begin{array}{c} 1.1_3 \equiv 1.1_4 \equiv 1.1_5 \equiv 1.1_6 \equiv 1.1_7, \\ 2.2_8 \equiv 2.2_9 \equiv 2.2_{10}, \\ 3.3_1 \equiv 3.3_2, \\ 4.4_3 \equiv 4.4_5 \equiv 4.4_8, \\ 5.5_4 \equiv 5.5_6 \equiv 5.5_7\ 5.5_9 \equiv 5.5_{10} \end{array} \right\}$$

Sub – system decomposition (2 – sub – systems inherited , indices have to be adjusted)

$$SR^{1}_{(1,2,3)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.2)_{1} & \longrightarrow & (1.3)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (2.1)_{1} & \longrightarrow & (2.2)_{1.2} & \longrightarrow & (2.3)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (3.1)_{3} & \longrightarrow & (3.2)_{2} & \longrightarrow & (3.3)_{2.3} \end{bmatrix}$$

$$SR^{2}_{(3,4,5)} = \begin{bmatrix} (3.3)_{1.3} & \longrightarrow & (3.4)_{1} & \longrightarrow & (3.5)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (4.3)_{1} & \longrightarrow & (4.4)_{1.2} & \longrightarrow & (4.5)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (5.3)_{3} & \longrightarrow & (5.4)_{2} & \longrightarrow & (5.5)_{2.3} \end{bmatrix}$$

$$SR^{3}_{(1,2,4)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.2)_{1} & \longrightarrow & (1.4)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (3.1)_{1} & \longrightarrow & (3.2)_{1.2} & \longrightarrow & (3.4)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (4.1)_{3} & \longrightarrow & (4.2)_{2} & \longrightarrow & (4.4)_{2.3} \end{bmatrix}$$

$$SR^{4}_{(1,2,5)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.2)_{1} & \longrightarrow & (1.5)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (2.1)_{1} & \longrightarrow & (2.2)_{1.2} & \longrightarrow & (2.5)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (5.1)_{3} & \longrightarrow & (5.2)_{2} & \longrightarrow & (5.5)_{2.3} \end{bmatrix}$$

$$SR^{5}_{(1,3,4)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.3)_{1} & \longrightarrow & (1.4)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (3.1)_{1} & \longrightarrow & (3.3)_{1.2} & \longrightarrow & (3.4)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (4.1)_{3} & \longrightarrow & (4.3)_{2} & \longrightarrow & (4.4)_{2.3} \end{bmatrix}$$

$$SR^{6}_{(1,3,5)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.3)_{1} & \longrightarrow & (1.5)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (3.1)_{1} & \longrightarrow & (3.3)_{1.2} & \longrightarrow & (3.5)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (5.1)_{3} & \longrightarrow & (5.3)_{2} & \longrightarrow & (5.5)_{2.3} \end{bmatrix}$$

$$SR^{7}_{(1,4,5)} = \begin{bmatrix} (1.1)_{1.3} & \longrightarrow & (1.4)_{1} & \longrightarrow & (1.5)_{3} \\ \downarrow & x & \downarrow & x & \downarrow \\ (4.1)_{1} & \longrightarrow & (4.4)_{1.2} & \longrightarrow & (4.5)_{2} \\ \downarrow & x & \downarrow & x & \downarrow \\ (5.1)_{3} & \longrightarrow & (5.4)_{2} & \longrightarrow & (5.5)_{2.3} \end{bmatrix}$$

Reduction of Sem_2 to Sem_1

$red(Sem^{(5,3,2)}) =$

MM	1	2	3	4	5
1	1.1	1.2	1.3	1.4	1.5
2	2.1	2.2	2.3	2.4	2.5
3	3.1	3.2	3.3	3.2	1.3
4	4.1	4.2	2.3	2.2	1.2
5	5.1	5.2	3.1	2.1	1.1

Replication of Sem_1 to $Sem_{1.1}$

$repl(Sem^{(5,3,2)}) =$

MM	1	2	3	4	5
1	$1.1_{1.1}$	$1.2_{1.1}$	$1.3_{1.1}$	1.4	1.5
2	$2.1_{1.1}$	$2.2_{1.1}$	$2.3_{1.1}$	2.4	2.5
3	$3.1_{1,1}$	$3.2_{1.1}$	$3.3_{1.1.2}$	3.4_2	3.5_2
4	4.1	4.2	4.3_2	4.4_2	4.5_2
5	5.1	5.2	5.3_2	5.4_2	5.5_2

Interaction between Sem_2 and Sem_1

$inter(Sem^{(5,3,2)}) =$

MM	1	2	3	4	5
1	1.1_1	3.4_2	3.5_2	1.4	1.5
2	3.4_2	2.2_1	2.3_1	2.4	2.5
3	3.5_2	3.2_1	$3.3_{1.2}$	3.4_2	3.5_2
4	4.1	4.2	3.4_2	4.4_2	4.5_2
5	5.1	5.2	3.5_2	5.4_s	5.5_2

4.1.4. What is the practical use of that fuss?

If there is any practical use for triadic-trichotomic semiotics, as Toth and others demonstrated *in extenso*, any extension of triadicity might open up some more complexity to deal with real-world matters in an operative and not reducing manner.

In sociology, cultural theory, international law, legitimations for torture and killing innocent people for good and accepted reasons, we encounter, in short, only *two* structural models of reasoning and acting. One is reducing complexity of what ever domain to a *binary* and *dichotomic* pattern. The other extreme is dissolving complexity into a *multitude* of autonomous isolated and and not-mediated dichotomous systems.

The first has the advantage of maximal *operativity* in technological and juridical systems, supporting nearly fully-automated surveillance systems and killing procedures.

The second is hopelessly non-operative and still based on humanistic propaganda for a better world - and even for Change.

"The genius of Michelangelo is like the genius of the Talmud, with several layers of meaning*, one on top of another. So you can interpret it in terms of Christianity and Judaism, sociologically, historically and artistically. We are just adding one level that has either been ignored or covered up over the centuries."* Cathryn Drake, Did Michelangelo Have a Hidden Agenda? http://online.wsj.com/article/SB122661765227326251.html

"For the third millennium, the struggle against semantic disorder and perversions of the intellect should supersede, precede and be sustained in all cultures, religions, systems of thought and political systems whenever there is a historical necessity to initiate a war of liberation from oppression, domination and exclusion." Mohammed Arkoun, ISLAM: To reform or to subvert?, The rule of law and civil society in Muslim context, Beyond Dualist Thinking, 2006, p. 381

Hence, the academic question still remains:
Wouldn't it be worth to support a developement of a cultural paradigm in which pluriversity *and* operativity *could co-operate together?*