

## 4. Sign connections

Sign connections can be static or dynamic. Amongst static sign connections, we search the dyadic sub-signs of the triadic sign relation, amongst dynamic sign connections the dyadic morphisms and heteromorphisms of the triadic sign relation. Further, both static and dynamic sign connection can be either intra- or inter-semiotic connection. An intra-semiotic connection stays inside of a sign class or reality thematic, an inter-semiotic connection works between sign classes, reality thematics or their permutations. These are the types of connections in monocontextural sign relations. In addition, in polycontextural sign relations, we have the connections between the contextures or inner environments.

Because of the 15'120 possible basic types of combinations of 3-adic 4-contextural sign classes (cf. ch. 3), we must restrict ourselves to a few examples of the main types of sign connections. However, we will show extensively the monocontextural, i.e. 3-adic 1-contextural sign connections.

### 4.1. Monocontextural sign connections

#### Static sign connections

##### 1. Intra-semiotic connections

Each sign class is connected with its reality thematics by at least 1 sub-sign:

1	(3.1 2.1 <u>1.1</u>	×	<u>1.1</u> 1.2 1.3)
2	(3.1 <u>2.1</u> <u>1.2</u>	×	<u>2.1</u> <u>1.2</u> 1.3)
3	( <u>3.1</u> 2.1 <u>1.3</u>	×	<u>3.1</u> 1.2 <u>1.3</u> )
4	(3.1 <u>2.2</u> 1.2	×	2.1 <u>2.2</u> 1.3)
5	( <u>3.1</u> <u>2.2</u> <u>1.3</u>	×	<u>3.1</u> <u>2.2</u> <u>1.3</u> )
6	( <u>3.1</u> 2.3 <u>1.3</u>	×	<u>3.1</u> 3.2 <u>1.3</u> )
7	(3.2 <u>2.2</u> 1.2	×	2.1 <u>2.2</u> 2.3)
8	(3.2 <u>2.2</u> 1.3	×	3.1 <u>2.2</u> 2.3)
9	( <u>3.2</u> <u>2.3</u> 1.3	×	3.1 <u>3.2</u> <u>2.3</u> )
10	( <u>3.3</u> 2.3 1.3	×	3.1 3.2 <u>3.3</u> )

We thus can differentiate between monadically, dyadically and triadically intra-semiotically connected sign classes and reality thematics.

## 2. Inter-semiotic connections

Sign classes and reality thematics are connected amongst themselves by 0, 1 or 2 sub-signs. The notation “ $x/y = z$ ” points out that a sign class  $x$  is connected with the sign class  $y$  by the sub-sign  $z$ :

$$\begin{aligned}
 1/2 &= 2; 1/3 = 2; 1/4 = 1; 1/5 = 1; 1/6 = 1; 1/7 = 0; 1/8 = 0; 1/9 = 0; 1/10 = 0 \\
 2/3 &= 2; 2/4 = 2; 2/5 = 1; 2/6 = 1; 2/7 = 1; 2/8 = 0; 2/9 = 0; 2/10 = 0 \\
 3/4 &= 1; 3/5 = 2; 3/6 = 2; 3/7 = 0; 3/8 = 1; 3/9 = 1; 3/10 = 1 \\
 4/5 &= 2; 4/6 = 1; 4/7 = 2; 4/8 = 1; 4/9 = 0; 4/10 = 0 \\
 5/6 &= 2; 5/7 = 1; 5/8 = 2; 5/9 = 1; 5/10 = 1 \\
 6/7 &= 0; 6/8 = 1; 6/9 = 2; 6/10 = 2 \\
 7/8 &= 2; 7/9 = 1; 7/10 = 0 \\
 8/9 &= 2; 8/10 = 1 \\
 9/10 &= 2
 \end{aligned}$$

Examples:

$$\begin{aligned}
 (3.2 \ 2.2 \ 1.2) / (3.3 \ 2.3 \ 1.3) &= \emptyset \\
 (3.2 \ 2.2 \ 1.3) / (3.3 \ 2.3 \ 1.3) &= (1.3) \\
 (3.2 \ 2.3 \ 1.3) / (3.3 \ 2.3 \ 1.3) &= (2.3 \ 1.3).
 \end{aligned}$$

## Dynamic sign connections

### 1. Intra-semiotic connections

Sign classes and their reality thematics can also be connected by identical pairs of sub-signs and thus by semiotic morphisms. In this case all permutations have to be scrutinized separately.

$$\begin{aligned}
 1 & \quad (3.1 \ 2.1 \ 1.1 \times 1.1 \ 1.2 \ 1.3) \\
 2 & \quad (3.1 \ \underline{2.1 \ 1.2} \times \underline{2.1 \ 1.2} \ 1.3) & \quad (2.1 \rightarrow 1.2) \\
 3 & \quad (3.1 \ 2.1 \ 1.3 \times 3.1 \ 1.2 \ 1.3) \\
 4 & \quad (3.1 \ 2.2 \ 1.2 \times 2.1 \ 2.2 \ 1.3) \\
 5 & \quad (\underline{3.1 \ 2.2 \ 1.3} \times \underline{3.1 \ 2.2 \ 1.3}) & \quad (3.1 \rightarrow 2.2) \ (2.2 \rightarrow 1.3) \\
 6 & \quad (3.1 \ 2.3 \ 1.3 \times 3.1 \ 3.2 \ 1.3)
 \end{aligned}$$

- 7 (3.2 2.2 1.2 × 2.1 2.2 2.3)
- 8 (3.2 2.2 1.3 × 3.1 2.2 2.3)
- 9 (3.2 2.3 1.3 × 3.1 3.2 2.3)
- 10 (3.3 2.3 1.3 × 3.1 3.2 3.3)

- 1 (3.1 1.1 2.1 × 1.2 1.1 1.3)
- 2 (3.1 1.2 2.1 × 1.2 2.1 1.3) (1.2 → 2.1)
- 3 (3.1 1.3 2.1 × 1.2 3.1 1.3) (3.1 → 1.3)
- 4 (3.1 1.2 2.2 × 2.2 2.1 1.3)
- 5 (3.1 1.3 2.2 × 2.2 3.1 1.3) (3.1 → 1.3)
- 6 (3.1 1.3 2.3 × 3.2 3.1 1.3) (3.1 → 1.3)
- 7 (3.2 1.2 2.2 × 2.2 2.1 2.3)
- 8 (3.2 1.3 2.2 × 2.2 3.1 2.3)
- 9 (3.2 1.3 2.3 × 3.2 3.1 2.3)
- 10 (3.3 1.3 2.3 × 3.2 3.1 3.3)

- 1 (2.1 3.1 1.1) × (1.1 1.3 1.2)
- 2 (2.1 3.1 1.2) × (2.1 1.3 1.2)
- 3 (2.1 3.1 1.3) × (3.1 1.3 1.2) (3.1 → 1.3)
- 4 (2.2 3.1 1.2) × (2.1 1.3 2.2)
- 5 (2.2 3.1 1.3) × (3.1 1.3 2.2)
- 6 (2.3 3.1 1.3) × (3.1 1.3 3.2) (3.1 → 1.3)
- 7 (2.2 3.2 1.2) × (2.1 2.3 2.2)
- 8 (2.2 3.2 1.3) × (3.1 2.3 2.2)
- 9 (2.3 3.2 1.3) × (3.1 2.3 3.2) (2.3 → 3.2)
- 10 (2.3 3.3 1.3) × (3.1 3.3 3.2)

- 1 (2.1 1.1 3.1) × (1.3 1.1 1.2)
- 2 (2.1 1.2 3.1) × (1.3 2.1 1.2) (2.1 → 1.2)
- 3 (2.1 1.3 3.1) × (1.3 3.1 1.2) (1.3 → 3.1)
- 4 (2.2 1.2 3.1) × (1.3 2.1 2.2)
- 5 (2.2 1.3 3.1) × (1.3 3.1 2.2) (1.3 → 3.1)
- 6 (2.3 1.3 3.1) × (1.3 3.1 3.2) (1.3 → 3.1)
- 7 (2.2 1.2 3.2) × (2.3 2.1 2.2)
- 8 (2.2 1.3 3.2) × (2.3 3.1 2.2)
- 9 (2.3 1.3 3.2) × (2.3 3.1 3.2)

10	(2.3 1.3 3.3) × (3.3 3.1 3.2)	
1	(1.1 3.1 2.1) × (1.2 1.3 1.1)	
2	(1.2 3.1 2.1) × (1.2 1.3 2.1)	
3	( <u>1.3 3.1</u> 2.1) × (1.2 <u>1.3 3.1</u> )	(1.3 → 3.1)
4	(1.2 3.1 2.2) × (2.2 1.3 2.1)	
5	( <u>1.3 3.1</u> 2.2) × (2.2 <u>1.3 3.1</u> )	(1.3 → 3.1)
6	( <u>1.3 3.1</u> 2.3) × (3.2 <u>1.3 3.1</u> )	(1.3 → 3.1)
7	(1.2 3.2 2.2) × (2.2 2.3 2.1)	
8	(1.3 3.2 2.2) × (2.2 2.3 3.1)	
9	(1.3 <u>3.2 2.3</u> ) × ( <u>3.2 2.3</u> 3.1)	(3.2 → 2.3)
10	(1.3 3.3 2.3) × (3.2 3.3 3.1)	
1	(1.1 2.1 3.1) × (1.3 1.2 1.1)	
2	( <u>1.2 2.1</u> 3.1) × (1.3 <u>1.2 2.1</u> )	(1.2 → 2.1)
3	(1.3 2.1 3.1) × (1.3 1.2 3.1)	
4	(1.2 2.2 3.1) × (1.3 2.2 2.1)	
5	( <u>1.3 2.2</u> 3.1) × ( <u>1.3 2.2</u> 3.1)	(1.3 → 2.2) (2.2 → 3.1)
6	(1.3 2.3 3.1) × (1.3 3.2 3.1)	
7	(1.2 2.2 3.2) × (2.3 2.2 2.1)	
8	(1.3 2.2 3.2) × (2.3 2.2 3.1)	
9	(1.3 <u>2.3 3.2</u> ) × ( <u>2.3 3.2</u> 3.1)	(2.3 → 3.2)
10	(1.3 2.3 3.3) × (3.3 3.2 3.1)	

Thus the connections of sign classes by semiotic morphisms are non-trivial, because they vary between all systems of permutations. Therefore, in the next chapter we shall show all possible combinations of permutations and their dualizations (thus including the sign classes and their reality thematics). Recurrent identical morphisms are solid, recurrent inverted morphisms are dotted.

## 2. Combinations of permutations and dual permutations

Since the occurrence and structure of dyadic and triadic morphismic connections between sign classes and reality thematics are not predictable, we will scrutinize them for each of the 10 sign classes separately, looking for combinations of permutations, of dual permutations and of combinations of permutations and dual permutations individually.

**Sign class (3.1 2.1 1.1)**

Permutations vs. permutations:

<u>3.1 2.1 1.1</u>	<u>3.1 1.1 2.1</u>	<u>3.1 1.1 2.1</u>	<u>2.1 3.1 1.1</u>	<u>2.1 3.1 1.1</u>	<u>2.1 1.1 3.1</u>
<u>3.1 2.1 1.1</u>	<u>2.1 3.1 1.1</u>	<u>3.1 1.1 2.1</u>	<u>2.1 1.1 3.1</u>	<u>2.1 3.1 1.1</u>	<u>1.1 3.1 2.1</u>
<u>3.1 2.1 1.1</u>	<u>2.1 1.1 3.1</u>	<u>3.1 1.1 2.1</u>	<u>1.1 3.1 2.1</u>	<u>2.1 3.1 1.1</u>	<u>1.1 2.1 3.1</u>
<u>3.1 2.1 1.1</u>	<u>1.1 3.1 2.1</u>	<u>3.1 1.1 2.1</u>	<u>1.1 2.1 3.1</u>		
<u>3.1 2.1 1.1</u>	<u>1.1 2.1 3.1</u>				
<u>2.1 1.1 3.1</u>	<u>1.1 3.1 2.1</u>	<u>1.1 3.1 2.1</u>	<u>1.1 2.1 3.1</u>		
<u>2.1 1.1 3.1</u>	<u>1.1 2.1 3.1</u>				

Dual permutations vs. dual permutations:

<u>1.1 1.2 1.3</u>	<u>1.2 1.1 1.3</u>	<u>1.2 1.1 1.3</u>	<u>1.1 1.3 1.2</u>	<u>1.1 1.3 1.2</u>	<u>1.3 1.1 1.2</u>
<u>1.1 1.2 1.3</u>	<u>1.1 1.3 1.2</u>	<u>1.2 1.1 1.3</u>	<u>1.3 1.1 1.2</u>	<u>1.1 1.3 1.2</u>	<u>1.2 1.3 1.1</u>
<u>1.1 1.2 1.3</u>	<u>1.3 1.1 1.2</u>	<u>1.2 1.1 1.3</u>	<u>1.2 1.3 1.1</u>	<u>1.1 1.3 1.2</u>	<u>1.3 1.2 1.1</u>
<u>1.1 1.2 1.3</u>	<u>1.2 1.3 1.1</u>	<u>1.2 1.1 1.3</u>	<u>1.3 1.2 1.1</u>		
<u>1.1 1.2 1.3</u>	<u>1.3 1.2 1.1</u>	<u>1.2 1.1 1.3</u>			
<u>1.3 1.1 1.2</u>	<u>1.2 1.3 1.1</u>	<u>1.2 1.3 1.1</u>	<u>1.3 1.2 1.1</u>		
<u>1.3 1.1 1.2</u>	<u>1.3 1.2 1.1</u>				

Permutations vs. dual permutations:

<u>3.1 2.1 1.1</u>	<u>1.2 1.1 1.3</u>	<u>3.1 1.1 2.1</u>	<u>1.1 1.3 1.2</u>	<u>2.1 3.1 1.1</u>	<u>1.3 1.1 1.2</u>
<u>3.1 2.1 1.1</u>	<u>1.1 1.3 1.2</u>	<u>3.1 1.1 2.1</u>	<u>1.3 1.1 1.2</u>	<u>2.1 3.1 1.1</u>	<u>1.2 1.3 1.1</u>
<u>3.1 2.1 1.1</u>	<u>1.3 1.1 1.2</u>	<u>3.1 1.1 2.1</u>	<u>1.2 1.3 1.1</u>	<u>2.1 3.1 1.1</u>	<u>1.3 1.2 1.1</u>
<u>3.1 2.1 1.1</u>	<u>1.2 1.3 1.1</u>	<u>3.1 1.1 2.1</u>	<u>1.3 1.2 1.1</u>		
<u>3.1 2.1 1.1</u>	<u>1.3 1.2 1.3</u>				
<u>2.1 1.1 3.1</u>	<u>1.2 1.3 1.1</u>	<u>1.1 3.1 2.1</u>	<u>1.3 1.2 1.1</u>		
<u>2.1 1.1 3.1</u>	<u>1.3 1.2 1.1</u>				

### Sign Class (3.1 2.1 1.2)

Permutations vs. permutations:

<u>3.1 2.1 1.2</u>	<u>3.1 1.2 2.1</u>	<u>3.1 1.2 2.1</u>	<u>2.1 3.1 1.2</u>	<u>2.1 3.1 1.2</u>	<u>2.1 1.2 3.1</u>
<u>3.1 2.1 1.2</u>	<u>2.1 3.1 1.2</u>	<u>3.1 1.2 2.1</u>	<u>2.1 1.2 3.1</u>	<u>2.1 3.1 1.2</u>	<u>1.2 3.1 2.1</u>
<u>3.1 2.1 1.2</u>	<u>2.1 1.2 3.1</u>	<u>3.1 1.2 2.1</u>	<u>1.2 3.1 2.1</u>	<u>2.1 3.1 1.2</u>	<u>1.2 2.1 3.1</u>
<u>3.1 2.1 1.2</u>	<u>1.2 3.1 2.1</u>	<u>3.1 1.2 2.1</u>	<u>1.2 2.1 3.1</u>		
<u>3.1 2.1 1.2</u>	<u>1.2 2.1 3.1</u>				
<u>2.1 1.2 3.1</u>	<u>1.2 3.1 2.1</u>	<u>1.2 3.1 2.1</u>	<u>1.2 2.1 3.1</u>		
<u>2.1 1.2 3.1</u>	<u>1.2 2.1 3.1</u>				

Dual permutations vs. dual permutations:

<u>2.1 1.2 1.3</u>	<u>1.2 2.1 1.3</u>	<u>1.2 2.1 1.3</u>	<u>2.1 1.3 1.2</u>	<u>2.1 1.3 1.2</u>	<u>1.3 2.1 1.2</u>
<u>2.1 1.2 1.3</u>	<u>2.1 1.3 1.2</u>	<u>1.2 2.1 1.3</u>	<u>1.3 2.1 1.2</u>	<u>2.1 1.3 1.2</u>	<u>1.2 1.3 2.1</u>
<u>2.1 1.2 1.3</u>	<u>1.3 2.1 1.2</u>	<u>1.2 2.1 1.3</u>	<u>1.2 1.3 2.1</u>	<u>2.1 1.3 1.2</u>	<u>1.3 1.2 2.1</u>
<u>2.1 1.2 1.3</u>	<u>1.2 1.3 2.1</u>	<u>1.2 2.1 1.3</u>	<u>1.3 1.2 2.1</u>		
<u>2.1 1.2 1.3</u>	<u>1.3 1.2 2.1</u>				
<u>1.3 2.1 1.2</u>	<u>1.2 1.3 2.1</u>	<u>1.2 1.3 2.1</u>	<u>1.3 1.2 2.1</u>		
<u>1.3 2.1 1.2</u>	<u>1.3 1.2 2.1</u>				

Permutations vs. dual permutations:

<u>3.1 2.1 1.2</u>	<u>1.2 2.1 1.3</u>	<u>3.1 1.2 2.1</u>	<u>2.1 1.3 1.2</u>	<u>2.1 3.1 1.2</u>	<u>1.3 2.1 1.2</u>
<u>3.1 2.1 1.2</u>	<u>2.1 1.3 1.2</u>	<u>3.1 1.2 2.1</u>	<u>1.3 2.1 1.2</u>	<u>2.1 3.1 1.2</u>	<u>1.2 1.3 2.1</u>
<u>3.1 2.1 1.2</u>	<u>1.3 2.1 1.2</u>	<u>3.1 1.2 2.1</u>	<u>1.2 1.3 2.1</u>	<u>2.1 3.1 1.2</u>	<u>1.3 1.2 2.1</u>
<u>3.1 2.1 1.2</u>	<u>1.2 1.3 2.1</u>	<u>3.1 1.2 2.1</u>	<u>1.3 1.2 2.1</u>		
<u>3.1 2.1 1.2</u>	<u>1.3 1.2 2.1</u>				
<u>2.1 1.2 3.1</u>	<u>1.2 1.3 2.1</u>	<u>1.2 3.1 2.1</u>	<u>1.3 1.2 2.1</u>		
<u>2.1 1.2 3.1</u>	<u>1.3 1.2 2.1</u>				

### Sign Class (3.1 2.1 1.3)

Permutations vs. permutations:

<u>3.1 2.1 1.3</u>	<u>3.1 1.3 2.1</u>	<u>3.1 1.3 2.1</u>	<u>2.1 3.1 1.3</u>	<u>2.1 3.1 1.3</u>	<u>2.1 1.3 3.1</u>
<u>3.1 2.1 1.3</u>	<u>2.1 3.1 1.3</u>	<u>3.1 1.3 2.1</u>	<u>2.1 1.3 3.1</u>	<u>2.1 3.1 1.3</u>	<u>1.3 3.1 2.1</u>
<u>3.1 2.1 1.3</u>	<u>2.1 1.3 3.1</u>	<u>3.1 1.3 2.1</u>	<u>1.3 3.1 2.1</u>	<u>2.1 3.1 1.3</u>	<u>1.3 2.1 3.1</u>
<u>3.1 2.1 1.3</u>	<u>1.3 3.1 2.1</u>	<u>3.1 1.3 2.1</u>	<u>1.3 2.1 3.1</u>		
<u>3.1 2.1 1.3</u>	<u>1.3 2.1 3.1</u>				
<u>2.1 1.3 3.1</u>	<u>1.3 3.1 2.1</u>	<u>1.3 3.1 2.1</u>	<u>1.3 2.1 3.1</u>		
<u>2.1 1.3 3.1</u>	<u>1.3 2.1 3.1</u>				

Dual permutations vs. dual permutations:

<u>3.1 1.2 1.3</u>	<u>1.2 3.1 1.3</u>	<u>1.2 3.1 1.3</u>	<u>3.1 1.3 1.2</u>	<u>3.1 1.3 1.2</u>	<u>1.3 3.1 1.2</u>
<u>3.1 1.2 1.3</u>	<u>3.1 1.3 1.2</u>	<u>1.2 3.1 1.3</u>	<u>1.3 3.1 1.2</u>	<u>3.1 1.3 1.2</u>	<u>1.2 1.3 3.1</u>
<u>3.1 1.2 1.3</u>	<u>1.3 3.1 1.2</u>	<u>1.2 3.1 1.3</u>	<u>1.2 1.3 3.1</u>	<u>3.1 1.3 1.2</u>	<u>1.3 1.2 3.1</u>
<u>3.1 1.2 1.3</u>	<u>1.2 1.3 3.1</u>	<u>1.2 3.1 1.3</u>	<u>1.3 1.2 3.1</u>		
<u>3.1 1.2 1.3</u>	<u>1.3 1.2 3.1</u>				
<u>1.3 3.1 1.2</u>	<u>1.2 1.3 3.1</u>	<u>1.2 1.3 3.1</u>	<u>1.3 1.2 3.1</u>		
<u>1.3 3.1 1.2</u>	<u>1.3 1.2 3.1</u>				

Permutations vs. dual permutations:

<u>3.1 2.1 1.3</u>	<u>1.2 3.1 1.3</u>	<u>3.1 1.3 2.1</u>	<u>3.1 1.3 1.2</u>	<u>2.1 3.1 1.3</u>	<u>1.3 3.1 1.2</u>
<u>3.1 2.1 1.3</u>	<u>3.1 1.3 1.2</u>	<u>3.1 1.3 2.1</u>	<u>1.3 3.1 1.2</u>	<u>2.1 3.1 1.3</u>	<u>1.2 1.3 3.1</u>
<u>3.1 2.1 1.3</u>	<u>1.3 3.1 1.2</u>	<u>3.1 1.3 2.1</u>	<u>1.2 1.3 3.1</u>	<u>2.1 3.1 1.3</u>	<u>1.3 1.2 3.1</u>
<u>3.1 2.1 1.3</u>	<u>1.2 1.3 3.1</u>	<u>3.1 1.3 2.1</u>	<u>1.3 1.2 3.1</u>		
<u>3.1 2.1 1.3</u>	<u>1.3 1.2 3.1</u>				
<u>2.1 1.3 3.1</u>	<u>1.2 1.3 3.1</u>	<u>1.3 3.1 2.1</u>	<u>1.3 1.2 3.1</u>		
<u>2.1 1.3 3.1</u>	<u>1.3 1.2 3.1</u>				

### Sign Class (3.1 2.2 1.2)

Permutations vs. permutations:

<u>3.1 2.2 1.2</u>	<u>3.1 1.2 2.2</u>	<u>3.1 1.2 2.2</u>	<u>2.2 3.1 1.2</u>	<u>2.2 3.1 1.2</u>	<u>2.2 1.2 3.1</u>
<u>3.1 2.2 1.2</u>	<u>2.2 3.1 1.2</u>	<u>3.1 1.2 2.2</u>	<u>2.2 1.2 3.1</u>	<u>2.2 3.1 1.2</u>	<u>1.2 3.1 2.2</u>
<u>3.1 2.2 1.2</u>	<u>2.2 1.2 3.1</u>	<u>3.1 1.2 2.2</u>	<u>1.2 3.1 2.2</u>	<u>2.2 3.1 1.2</u>	<u>1.2 2.2 3.1</u>
<u>3.1 2.2 1.2</u>	<u>1.2 3.1 2.2</u>	<u>3.1 1.2 2.2</u>	<u>1.2 2.2 3.1</u>		
<u>3.1 2.2 1.2</u>	<u>1.2 2.2 3.1</u>				
<u>2.2 1.2 3.1</u>	<u>1.2 3.1 2.2</u>	<u>1.2 3.1 2.2</u>	<u>1.2 2.2 3.1</u>		
<u>2.2 1.2 3.1</u>	<u>1.2 2.2 3.1</u>				

Dual permutations vs. dual permutations:

<u>2.1 2.2 1.3</u>	<u>2.2 2.1 1.3</u>	<u>2.2 2.1 1.3</u>	<u>2.1 1.3 2.2</u>	<u>2.1 1.3 2.2</u>	<u>1.3 2.1 2.2</u>
<u>2.1 2.2 1.3</u>	<u>2.1 1.3 2.2</u>	<u>2.2 2.1 1.3</u>	<u>1.3 2.1 2.2</u>	<u>2.1 1.3 2.2</u>	<u>2.2 1.3 2.1</u>
<u>2.1 2.2 1.3</u>	<u>1.3 2.1 2.2</u>	<u>2.2 2.1 1.3</u>	<u>2.2 1.3 2.1</u>	<u>2.1 1.3 2.2</u>	<u>1.3 2.2 2.1</u>
<u>2.1 2.2 1.3</u>	<u>2.2 1.3 2.1</u>	<u>2.2 2.1 1.3</u>	<u>1.3 2.2 2.1</u>		
<u>2.1 2.2 1.3</u>	<u>1.3 2.2 2.1</u>				
<u>1.3 2.1 2.2</u>	<u>2.2 1.3 2.1</u>	<u>2.2 1.3 2.1</u>	<u>1.3 2.2 2.1</u>		
<u>1.3 2.1 2.2</u>	<u>2.2 1.3 2.1</u>				

Permutations vs. dual permutations:

<u>3.1 2.2 1.2</u>	<u>2.2 2.1 1.3</u>	<u>3.1 1.2 2.2</u>	<u>2.1 1.3 2.2</u>	<u>2.2 3.1 1.2</u>	<u>1.3 2.1 2.2</u>
<u>3.1 2.2 1.2</u>	<u>2.1 1.3 2.2</u>	<u>3.1 1.2 2.2</u>	<u>1.3 2.1 2.2</u>	<u>2.2 3.1 1.2</u>	<u>2.2 1.3 2.1</u>
<u>3.1 2.2 1.2</u>	<u>1.3 2.1 2.2</u>	<u>3.1 1.2 2.2</u>	<u>2.2 1.3 2.1</u>	<u>2.2 3.1 1.2</u>	<u>1.3 2.2 2.1</u>
<u>3.1 2.2 1.2</u>	<u>2.2 1.3 2.1</u>	<u>3.1 1.2 2.2</u>	<u>1.3 2.2 2.1</u>		
<u>3.1 2.2 1.2</u>	<u>1.3 2.2 2.1</u>				
<u>2.2 1.2 3.1</u>	<u>2.2 1.3 2.1</u>	<u>1.2 3.1 2.2</u>	<u>1.3 2.2 2.1</u>		
<u>2.2 1.2 3.1</u>	<u>1.3 2.2 2.1</u>				



### Sign Class (3.1 2.2 1.3)

Permutations vs. Permutations:

<u>3.1 2.2 1.3</u>	<u>3.1 1.3 2.2</u>	<u>3.1 1.3 2.2</u>	<u>2.2 3.1 1.3</u>	<u>2.2 3.1 1.3</u>	<u>2.2 1.3 3.1</u>
<u>3.1 2.2 1.3</u>	<u>2.2 3.1 1.3</u>	<u>3.1 1.3 2.2</u>	<u>2.2 1.3 3.1</u>	<u>2.2 3.1 1.3</u>	<u>1.3 3.1 2.2</u>
<u>3.1 2.2 1.3</u>	<u>2.2 1.3 3.1</u>	<u>3.1 1.3 2.2</u>	<u>1.3 3.1 2.2</u>	<u>2.2 3.1 1.3</u>	<u>1.3 2.2 3.1</u>
<u>3.1 2.2 1.3</u>	<u>1.3 3.1 2.2</u>	<u>3.1 1.3 2.2</u>	<u>1.3 2.2 3.1</u>		
<u>3.1 2.2 1.3</u>	<u>1.3 2.2 3.1</u>				
<u>2.2 1.3 3.1</u>	<u>1.3 3.1 2.2</u>	<u>1.3 3.1 2.2</u>	<u>1.3 2.2 3.1</u>		
<u>2.2 1.3 3.1</u>	<u>1.3 2.2 3.1</u>				

Dual permutations vs. dual permutations:

<u>3.1 2.2 1.3</u>	<u>2.2 3.1 1.3</u>	<u>2.2 3.1 1.3</u>	<u>3.1 1.3 2.2</u>	<u>3.1 1.3 2.2</u>	<u>1.3 3.1 2.2</u>
<u>3.1 2.2 1.3</u>	<u>3.1 1.3 2.2</u>	<u>2.2 3.1 1.3</u>	<u>1.3 3.1 2.2</u>	<u>3.1 1.3 2.2</u>	<u>2.2 1.3 3.1</u>
<u>3.1 2.2 1.3</u>	<u>1.3 3.1 2.2</u>	<u>2.2 3.1 1.3</u>	<u>2.2 1.3 3.1</u>	<u>3.1 1.3 2.2</u>	<u>1.3 2.2 3.1</u>
<u>3.1 2.2 1.3</u>	<u>2.2 1.3 3.1</u>	<u>2.2 3.1 1.3</u>	<u>1.3 2.2 3.1</u>		
<u>3.1 2.2 1.3</u>	<u>1.3 2.2 3.1</u>				
<u>1.3 3.1 2.2</u>	<u>2.2 1.3 3.1</u>	<u>2.2 1.3 3.1</u>	<u>1.3 2.2 3.1</u>		
<u>1.3 3.1 2.2</u>	<u>1.3 2.2 3.1</u>				

Permutations vs. dual permutations:

<u>3.1 2.2 1.3</u>	<u>2.2 3.1 1.3</u>	<u>3.1 1.3 2.2</u>	<u>3.1 1.3 2.2</u>	<u>2.2 3.1 1.3</u>	<u>1.3 3.1 2.2</u>
<u>3.1 2.2 1.3</u>	<u>3.1 1.3 2.2</u>	<u>3.1 1.3 2.2</u>	<u>1.3 3.1 2.2</u>	<u>2.2 3.1 1.3</u>	<u>2.2 1.3 3.1</u>
<u>3.1 2.2 1.3</u>	<u>1.3 3.1 2.2</u>	<u>3.1 1.3 2.2</u>	<u>2.2 1.3 3.1</u>	<u>2.2 3.1 1.3</u>	<u>1.3 2.2 3.1</u>
<u>3.1 2.2 1.3</u>	<u>2.2 1.3 3.1</u>	<u>3.1 1.3 2.2</u>	<u>1.3 2.2 3.1</u>		
<u>3.1 2.2 1.3</u>	<u>1.3 2.2 3.1</u>				
<u>2.2 1.3 3.1</u>	<u>2.2 1.3 3.1</u>	<u>1.3 3.1 2.2</u>	<u>1.3 2.2 3.1</u>		
<u>2.2 1.3 3.1</u>	<u>1.3 2.2 3.1</u>				

### Sign Class (3.1 2.3 1.3)

Permutations vs. permutations:

<u>3.1 2.3 1.3</u>	<u>3.1 1.3 2.3</u>	<u>3.1 1.3 2.3</u>	<u>2.3 3.1 1.3</u>	<u>2.3 3.1 1.3</u>	<u>2.3 1.3 3.1</u>
<u>3.1 2.3 1.3</u>	<u>2.3 3.1 1.3</u>	<u>3.1 1.3 2.3</u>	<u>2.3 1.3 3.1</u>	<u>2.3 3.1 1.3</u>	<u>1.3 3.1 2.3</u>
<u>3.1 2.3 1.3</u>	<u>2.3 1.3 3.1</u>	<u>3.1 1.3 2.3</u>	<u>1.3 3.1 2.3</u>	<u>2.3 3.1 1.3</u>	<u>1.3 2.3 3.1</u>
<u>3.1 2.3 1.3</u>	<u>1.3 3.1 2.3</u>	<u>3.1 1.3 2.3</u>	<u>1.3 2.3 3.1</u>		
<u>3.1 2.3 1.3</u>	<u>1.3 2.3 3.1</u>				
<u>2.3 1.3 3.1</u>	<u>1.3 3.1 2.3</u>	<u>1.3 3.1 2.3</u>	<u>1.3 2.3 3.1</u>		
<u>2.3 1.3 3.1</u>	<u>1.3 2.3 3.1</u>				

Dual permutations vs. dual permutations:

<u>3.1 3.2 1.3</u>	<u>3.2 3.1 1.3</u>	<u>3.2 3.1 1.3</u>	<u>3.1 1.3 3.2</u>	<u>3.1 1.3 3.2</u>	<u>1.3 3.1 3.2</u>
<u>3.1 3.2 1.3</u>	<u>3.1 1.3 3.2</u>	<u>3.2 3.1 1.3</u>	<u>1.3 3.1 3.2</u>	<u>3.1 1.3 3.2</u>	<u>3.2 1.3 3.1</u>
<u>3.1 3.2 1.3</u>	<u>1.3 3.1 3.2</u>	<u>3.2 3.1 1.3</u>	<u>3.2 1.3 3.1</u>	<u>3.1 1.3 3.2</u>	<u>1.3 3.2 3.1</u>
<u>3.1 3.2 1.3</u>	<u>3.2 1.3 3.1</u>	<u>3.2 3.1 1.3</u>	<u>1.3 3.2 3.1</u>		
<u>3.1 3.2 1.3</u>	<u>1.3 3.2 3.1</u>				
<u>1.3 3.1 3.2</u>	<u>3.2 1.3 3.1</u>	<u>3.2 1.3 3.1</u>	<u>1.3 3.2 3.1</u>		
<u>1.3 3.1 3.2</u>	<u>1.3 3.2 3.1</u>				

Permutations vs. dual permutations:

<u>3.1 2.3 1.3</u>	<u>3.2 3.1 1.3</u>	<u>3.1 1.3 2.3</u>	<u>3.1 1.3 3.2</u>	<u>2.3 3.1 1.3</u>	<u>1.3 3.1 3.2</u>
<u>3.1 2.3 1.3</u>	<u>3.1 1.3 3.2</u>	<u>3.1 1.3 2.3</u>	<u>1.3 3.1 3.2</u>	<u>2.3 3.1 1.3</u>	<u>3.2 1.3 3.1</u>
<u>3.1 2.3 1.3</u>	<u>1.3 3.1 3.2</u>	<u>3.1 1.3 2.3</u>	<u>3.2 1.3 3.1</u>	<u>2.3 3.1 1.3</u>	<u>1.3 3.2 3.1</u>
<u>3.1 2.3 1.3</u>	<u>3.2 1.3 3.1</u>	<u>3.1 1.3 2.3</u>	<u>1.3 3.2 3.1</u>		
<u>3.1 2.3 1.3</u>	<u>1.3 3.2 3.1</u>				
<u>2.3 1.3 3.1</u>	<u>3.2 1.3 3.1</u>	<u>1.3 3.1 2.3</u>	<u>1.3 3.2 3.1</u>		
<u>1.3 3.1 3.2</u>	<u>1.3 3.2 3.1</u>				

### Sign Class (3.2 2.2 1.2)

Permutations vs. permutations:

<u>3.2 2.2 1.2</u>	<u>3.2 1.2 2.2</u>	<u>3.2 1.2 2.2</u>	<u>2.2 3.2 1.2</u>	<u>2.2 3.2 1.2</u>	<u>2.2 1.2 3.2</u>
<u>3.2 2.2 1.2</u>	<u>2.2 3.2 1.2</u>	<u>3.2 1.2 2.2</u>	<u>2.2 1.2 3.2</u>	<u>2.2 3.2 1.2</u>	<u>1.2 3.2 2.2</u>
<u>3.2 2.2 1.2</u>	<u>2.2 1.2 3.2</u>	<u>3.2 1.2 2.2</u>	<u>1.2 3.2 2.2</u>	<u>2.2 3.2 1.2</u>	<u>1.2 2.2 3.2</u>
<u>3.2 2.2 1.2</u>	<u>1.2 3.2 2.2</u>	<u>3.2 1.2 2.2</u>	<u>1.2 2.2 3.2</u>		
<u>3.2 2.2 1.2</u>	<u>1.2 2.2 3.2</u>				
<u>2.2 1.2 3.2</u>	<u>1.2 3.2 2.2</u>	<u>1.2 3.2 2.2</u>	<u>1.2 2.2 3.2</u>		
<u>2.2 1.2 3.2</u>	<u>1.2 2.2 3.2</u>				

Dual permutations vs. dual permutations:

<u>2.1 2.2 2.3</u>	<u>2.2 2.1 2.3</u>	<u>2.2 2.1 2.3</u>	<u>2.1 2.3 2.2</u>	<u>2.1 2.3 2.2</u>	<u>2.3 2.1 2.2</u>
<u>2.1 2.2 2.3</u>	<u>2.1 2.3 2.2</u>	<u>2.2 2.1 2.3</u>	<u>2.3 2.1 2.2</u>	<u>2.1 2.3 2.2</u>	<u>2.2 2.3 2.1</u>
<u>2.1 2.2 2.3</u>	<u>2.3 2.1 2.2</u>	<u>2.2 2.1 2.3</u>	<u>2.2 2.3 2.1</u>	<u>2.1 2.3 2.2</u>	<u>2.3 2.2 2.1</u>
<u>2.1 2.2 2.3</u>	<u>2.2 2.3 2.1</u>	<u>2.2 2.1 2.3</u>	<u>2.3 2.2 2.1</u>		
<u>2.1 2.2 2.3</u>	<u>2.3 2.2 2.1</u>				
<u>2.3 2.1 2.2</u>	<u>2.2 2.3 2.1</u>	<u>2.2 2.3 2.1</u>	<u>2.3 2.2 2.1</u>		
<u>2.3 2.1 2.2</u>	<u>2.3 2.2 2.1</u>				

Permutations vs. dual permutations:

<u>3.2 2.2 1.2</u>	<u>2.2 2.1 2.3</u>	<u>3.2 1.2 2.2</u>	<u>2.1 2.3 2.2</u>	<u>2.2 3.2 1.2</u>	<u>2.3 2.1 2.2</u>
<u>3.2 2.2 1.2</u>	<u>2.1 2.3 2.2</u>	<u>3.2 1.2 2.2</u>	<u>2.3 2.1 2.2</u>	<u>2.2 3.2 1.2</u>	<u>2.2 2.3 2.1</u>
<u>3.2 2.2 1.2</u>	<u>2.3 2.1 2.2</u>	<u>3.2 1.2 2.2</u>	<u>2.2 2.3 2.1</u>	<u>2.2 3.2 1.2</u>	<u>2.3 2.2 2.1</u>
<u>3.2 2.2 1.2</u>	<u>2.2 2.3 2.1</u>	<u>3.2 1.2 2.2</u>	<u>2.3 2.2 2.1</u>		
<u>3.2 2.2 1.2</u>	<u>2.3 2.2 2.1</u>				
<u>2.2 1.2 3.2</u>	<u>2.2 2.3 2.1</u>	<u>1.2 3.2 2.2</u>	<u>2.3 2.2 2.1</u>		
<u>2.2 1.2 3.2</u>	<u>2.3 2.2 2.1</u>				

### Sign Class (3.2 2.2 1.3)

Permutations vs. permutations:

<u>3.2 2.2 1.3</u>	<u>3.2 1.3 2.2</u>	<u>3.2 1.3 2.2</u>	<u>2.2 3.2 1.3</u>	<u>2.2 3.2 1.3</u>	<u>2.2 1.3 3.2</u>
<u>3.2 2.2 1.3</u>	<u>2.2 3.2 1.3</u>	<u>3.2 1.3 2.2</u>	<u>2.2 1.3 3.2</u>	<u>2.2 3.2 1.3</u>	<u>1.3 3.2 2.2</u>
<u>3.2 2.2 1.3</u>	<u>2.2 1.3 3.2</u>	<u>3.2 1.3 2.2</u>	<u>1.3 3.2 2.2</u>	<u>2.2 3.2 1.3</u>	<u>1.3 2.2 3.2</u>
<u>3.2 2.2 1.3</u>	<u>1.3 3.2 2.2</u>	<u>3.2 1.3 2.2</u>	<u>1.3 2.2 3.2</u>		
<u>3.2 2.2 1.3</u>	<u>1.3 2.2 3.2</u>				
<u>2.2 1.3 3.2</u>	<u>1.3 3.2 2.2</u>	<u>1.3 3.2 2.2</u>	<u>1.3 2.2 3.2</u>		
<u>2.2 1.3 3.2</u>	<u>1.3 2.2 3.2</u>				

Dual permutations vs. dual permutations:

<u>3.1 2.2 2.3</u>	<u>2.2 3.1 2.3</u>	<u>2.2 3.1 2.3</u>	<u>3.1 2.3 2.2</u>	<u>3.1 2.3 2.2</u>	<u>2.3 3.1 2.2</u>
<u>3.1 2.2 2.3</u>	<u>3.1 2.3 2.2</u>	<u>2.2 3.1 2.3</u>	<u>2.3 3.1 2.2</u>	<u>3.1 2.3 2.2</u>	<u>2.2 2.3 3.1</u>
<u>3.1 2.2 2.3</u>	<u>2.3 3.1 2.2</u>	<u>2.2 3.1 2.3</u>	<u>2.2 2.3 3.1</u>	<u>3.1 2.3 2.2</u>	<u>2.3 2.2 3.1</u>
<u>3.1 2.2 2.3</u>	<u>2.2 2.3 3.1</u>	<u>2.2 3.1 2.3</u>	<u>2.3 2.2 3.1</u>		
<u>3.1 2.2 2.3</u>	<u>2.3 2.2 3.1</u>				
<u>2.3 3.1 2.2</u>	<u>2.2 2.3 3.1</u>	<u>2.2 2.3 3.1</u>	<u>2.3 2.2 3.1</u>		
<u>2.3 3.1 2.2</u>	<u>2.3 2.2 3.1</u>				

Permutations vs. dual permutations:

<u>3.2 2.2 1.3</u>	<u>2.2 3.1 2.3</u>	<u>3.2 1.3 2.2</u>	<u>3.1 2.3 2.2</u>	<u>2.2 3.2 1.3</u>	<u>2.3 3.1 2.2</u>
<u>3.2 2.2 1.3</u>	<u>3.1 2.3 2.2</u>	<u>3.2 1.3 2.2</u>	<u>2.3 3.1 2.2</u>	<u>2.2 3.2 1.3</u>	<u>2.2 2.3 3.1</u>
<u>3.2 2.2 1.3</u>	<u>2.3 3.1 2.2</u>	<u>3.2 1.3 2.2</u>	<u>2.2 2.3 3.1</u>	<u>2.2 3.2 1.3</u>	<u>2.3 2.2 3.1</u>
<u>3.2 2.2 1.3</u>	<u>2.2 2.3 3.1</u>	<u>3.2 1.3 2.2</u>	<u>2.3 2.2 3.1</u>		
<u>3.2 2.2 1.3</u>	<u>2.3 2.2 3.1</u>				
<u>2.2 1.3 3.2</u>	<u>2.2 2.3 3.1</u>	<u>1.3 3.2 2.2</u>	<u>2.3 2.2 3.1</u>		
<u>2.2 1.3 3.2</u>	<u>2.3 2.2 3.1</u>				

### Sign Class (3.2 2.3 1.3)

Permutations vs. permutations:

<u>3.2 2.3 1.3</u>	<u>3.2 1.3 2.3</u>	<u>3.2 1.3 2.3</u>	<u>2.3 3.2 1.3</u>	<u>2.3 3.2 1.3</u>	<u>2.3 1.3 3.2</u>
<u>3.2 2.3 1.3</u>	<u>2.3 3.2 1.3</u>	<u>3.2 1.3 2.3</u>	<u>2.3 1.3 3.2</u>	<u>2.3 3.2 1.3</u>	<u>1.3 3.2 2.3</u>
<u>3.2 2.3 1.3</u>	<u>2.3 1.3 3.2</u>	<u>3.2 1.3 2.3</u>	<u>1.3 3.2 2.3</u>	<u>2.3 3.2 1.3</u>	<u>1.3 2.3 3.2</u>
<u>3.2 2.3 1.3</u>	<u>1.3 3.2 2.3</u>	<u>3.2 1.3 2.3</u>	<u>1.3 2.3 3.2</u>		
<u>3.2 2.3 1.3</u>	<u>1.3 2.3 3.2</u>				
<u>2.3 1.3 3.2</u>	<u>1.3 3.2 2.3</u>	<u>1.3 3.2 2.3</u>	<u>1.3 2.3 3.2</u>		
<u>2.3 1.3 3.2</u>	<u>1.3 2.3 3.2</u>				

Dual permutations vs. dual permutations:

<u>3.1 3.2 2.3</u>	<u>3.2 3.1 2.3</u>	<u>3.2 3.1 2.3</u>	<u>3.1 2.3 3.2</u>	<u>3.1 2.3 3.2</u>	<u>2.3 3.1 3.2</u>
<u>3.1 3.2 2.3</u>	<u>3.1 2.3 3.2</u>	<u>3.2 3.1 2.3</u>	<u>2.3 3.1 3.2</u>	<u>3.1 2.3 3.2</u>	<u>3.2 2.3 3.1</u>
<u>3.1 3.2 2.3</u>	<u>2.3 3.1 3.2</u>	<u>3.2 3.1 2.3</u>	<u>3.2 2.3 3.1</u>	<u>3.1 2.3 3.2</u>	<u>2.3 3.2 3.1</u>
<u>3.1 3.2 2.3</u>	<u>3.2 2.3 3.1</u>	<u>3.2 3.1 2.3</u>	<u>2.3 3.2 3.1</u>		
<u>3.1 3.2 2.3</u>	<u>2.3 3.2 3.1</u>				
<u>2.3 3.1 3.2</u>	<u>3.2 2.3 3.1</u>	<u>3.2 2.3 3.1</u>	<u>2.3 3.2 3.1</u>		
<u>2.3 3.1 3.2</u>	<u>2.3 3.2 3.1</u>				

Permutations vs. dual permutations:

<u>3.2 2.3 1.3</u>	<u>3.2 3.1 2.3</u>	<u>3.2 1.3 2.3</u>	<u>3.1 2.3 3.2</u>	<u>2.3 3.2 1.3</u>	<u>2.3 3.1 3.2</u>
<u>3.2 2.3 1.3</u>	<u>3.1 2.3 3.2</u>	<u>3.2 1.3 2.3</u>	<u>2.3 3.1 3.2</u>	<u>2.3 3.2 1.3</u>	<u>3.2 2.3 3.1</u>
<u>3.2 2.3 1.3</u>	<u>2.3 3.1 3.2</u>	<u>3.2 1.3 2.3</u>	<u>3.2 2.3 3.1</u>	<u>2.3 3.2 1.3</u>	<u>2.3 3.2 3.1</u>
<u>3.2 2.3 1.3</u>	<u>3.2 2.3 3.1</u>	<u>3.2 1.3 2.3</u>	<u>2.3 3.2 3.1</u>		
<u>3.2 2.3 1.3</u>	<u>2.3 3.2 3.1</u>				
<u>2.3 1.3 3.2</u>	<u>3.2 2.3 3.1</u>	<u>1.3 3.2 2.3</u>	<u>2.3 3.2 3.1</u>		
<u>2.3 1.3 3.2</u>	<u>2.3 3.2 3.1</u>				

### Sign Class (3.3 2.3 1.3)

Permutations vs. permutations:

<u>3.3 2.3 1.3</u>	<u>3.3 1.3 2.3</u>	<u>3.3 1.3 2.3</u>	<u>2.3 3.3 1.3</u>	<u>2.3 3.3 1.3</u>	<u>2.3 1.3 3.3</u>
<u>3.3 2.3 1.3</u>	<u>2.3 3.3 1.3</u>	<u>3.3 1.3 2.3</u>	<u>2.3 1.3 3.3</u>	<u>2.3 3.3 1.3</u>	<u>1.3 3.3 2.3</u>
<u>3.3 2.3 1.3</u>	<u>2.3 1.3 3.3</u>	<u>3.3 1.3 2.3</u>	<u>1.3 3.3 2.3</u>	<u>2.3 3.3 1.3</u>	<u>1.3 2.3 3.3</u>
<u>3.3 2.3 1.3</u>	<u>1.3 3.3 2.3</u>	<u>3.3 1.3 2.3</u>	<u>1.3 2.3 3.3</u>		
<u>3.3 2.3 1.3</u>	<u>1.3 2.3 3.3</u>				
<u>2.3 1.3 3.3</u>	<u>1.3 3.3 2.3</u>	<u>1.3 3.3 2.3</u>	<u>1.3 2.3 3.3</u>		
<u>2.3 1.3 3.3</u>	<u>1.3 2.3 3.3</u>				

Dual permutations vs. dual permutations:

<u>3.1 3.2 3.3</u>	<u>3.2 3.1 3.3</u>	<u>3.2 3.1 3.3</u>	<u>3.1 3.3 3.2</u>	<u>3.1 3.3 3.2</u>	<u>3.3 3.1 3.2</u>
<u>3.1 3.2 3.3</u>	<u>3.1 3.3 3.2</u>	<u>3.2 3.1 3.3</u>	<u>3.3 3.1 3.2</u>	<u>3.1 3.3 3.2</u>	<u>3.2 3.3 3.1</u>
<u>3.1 3.2 3.3</u>	<u>3.3 3.1 3.2</u>	<u>3.2 3.1 3.3</u>	<u>3.2 3.3 3.1</u>	<u>3.1 3.3 3.2</u>	<u>3.3 3.2 3.1</u>
<u>3.1 3.2 3.3</u>	<u>3.2 3.3 3.1</u>	<u>3.2 3.1 3.3</u>	<u>3.3 3.2 3.1</u>		
<u>3.1 3.2 3.3</u>	<u>3.3 3.2 3.1</u>				
<u>3.3 3.1 3.2</u>	<u>3.2 3.3 3.1</u>	<u>3.2 3.3 3.1</u>	<u>3.3 3.2 3.1</u>		
<u>3.3 3.1 3.2</u>	<u>3.3 3.2 3.1</u>				

Permutations vs. dual permutations:

<u>3.3 2.3 1.3</u>	<u>3.2 3.1 3.3</u>	<u>3.3 1.3 2.3</u>	<u>3.1 3.3 3.2</u>	<u>2.3 3.3 1.3</u>	<u>3.3 3.1 3.2</u>
<u>3.3 2.3 1.3</u>	<u>3.1 3.3 3.2</u>	<u>3.3 1.3 2.3</u>	<u>3.3 3.1 3.2</u>	<u>2.3 3.3 1.3</u>	<u>3.2 3.3 3.1</u>
<u>3.3 2.3 1.3</u>	<u>3.3 3.1 3.2</u>	<u>3.3 1.3 2.3</u>	<u>3.2 3.3 3.1</u>	<u>2.3 3.3 1.3</u>	<u>3.3 3.2 3.1</u>
<u>3.3 2.3 1.3</u>	<u>3.2 3.3 3.1</u>	<u>3.3 1.3 2.3</u>	<u>3.3 3.2 3.1</u>		
<u>3.3 2.3 1.3</u>	<u>3.3 3.2 3.1</u>				
<u>2.3 1.3 3.3</u>	<u>3.2 3.3 3.1</u>	<u>1.3 3.3 2.3</u>	<u>3.3 3.2 3.1</u>		
<u>2.3 1.3 3.3</u>	<u>3.3 3.2 3.1</u>				

## 4.2. Polycontextural sign connections

In monocontextural semiotics, pairs of dualized sub-signs are treated as identical, f. ex.:

$$\times(3.1) = (1.3)$$

On this strictly monocontextural principle (cf. Kaehr 2009b), the inter-semiotic connections between sign classes and reality thematics are established, e.g.:

$$(\underline{3.1} \ 2.1 \ \underline{1.3}) \times (\underline{3.1} \ 1.2 \ \underline{1.3}),$$

but consider

$$(\underline{3.1} \ 2.1 \ \underline{1.3}) \times (\underline{3.1} \ 1.2 \ \underline{1.3}).$$

and not

$$(\underline{3.1} \ 2.1 \ \underline{1.3}) \times (\underline{3.1} \ 1.2 \ \underline{1.3}).$$

because  $\times(3.1) = (1.3)$  and  $\times(1.3) = (3.1)$ . Moreover, since, according to Kaehr (2009b), we even have

$$\times(\text{idx}) \neq (\text{idx}), x \in \{1, 2, 3\},$$

it follows especially that

$$\times(3.1 \ 2.2 \ 1.3) \neq (3.1 \ 2.2 \ 1.3)$$

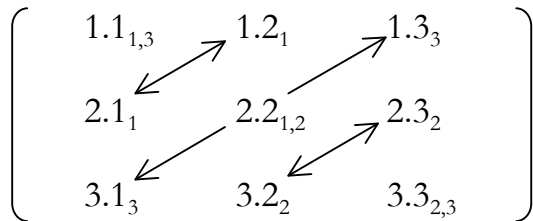
in contradiction with the classical-semiotic theory of eigenreality (Bense 1992).

The reason for the disequations is that “self-identity is able to distinguish its directionality as left (lo) and right (ro) order” (Kaehr 2009b, p. 2).

From a polycontextural standpoint, this leads to the paradoxical situation that we have on the one side

$$K(a.b) = K(b.a),$$

i.e. the contexture of a sub-sign (a.b) is identical with the contexture of its inverted sub-sign. One can show that best in a semiotic matrix



However, if not only the sub-signs, but the contextures as well are inverted

$$\times(K(a.b)) \neq K(b.a),$$

we get again disequations. Examples:

$$\times(3.1_3 \ 2.2_{1,2} \ 1.2_1) = (2.1_1 \ 2.2_{2,1} \ 1.3_1) \Rightarrow (2.2_{1,2}) \neq (2.2_{2,1})$$

$$\times(3.3_{2,3} \ 2.3_2 \ 1.3_3) = (3.1_3 \ 3.2_2 \ 3.3_{3,2}) \Rightarrow (3.3_{2,3}) \neq (3.3_{3,2})$$

Therefore, strictly speaking, there are no sign connection besides sign connections via common inner environments!

On the other side, if we keep up with the classical, monocontextural semiotic tradition to interpret seemingly identical common sub-signs as sign connections, the introduction of environments, i.e. of contextures, discloses a never foreseen wealth of both intra- and inter-connections which show enormous amounts of hidden semiotic structures. F. ex., from a monocontextural standpoint, there are no sign connections between the fundamental categories of the prime-sign relation

$$PS = (.1., .2., .3.),$$

although (.1.) is a monad and included both in the dyad (.2.) and in the triad (.3.), and (.2.) is a dyad included in the triad (.3.), cf. Bense (1979, p. 53).



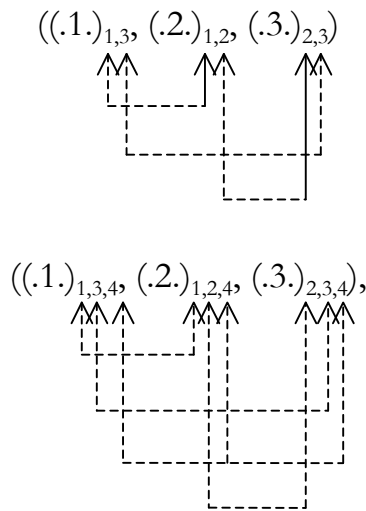
However, from a polycontextural standpoint, we get in the case of 3-contextural PS

$$PS_3 = ((.1.)_{1,3}, (.2.)_{1,2}, (.3.)_{2,3})$$

and in the case of 4-contextural PS

$$PS_4 = ((.1.)_{1,3,4}, (.2.)_{1,2,4}, (.3.)_{2,3,4}),$$

and therefore sets of prime-signs which are connected by their inner environments as follows



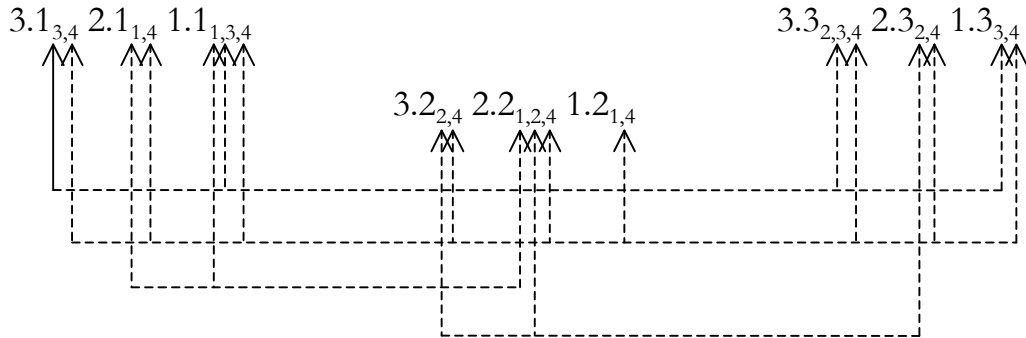
Naturally, the complexity of connections by inner semiotic environments increases with the increasing number of contextures involved.

The sets of prime-signs are examples of connections solely by their inner semiotic environments. If we have another look at the 3-contextural triadic semiotic matrix

$$\left( \begin{array}{ccc} 1.1_{1,3} & 1.2_1 & 1.3_3 \\ 2.1_1 & 2.2_{1,2} & 2.3_2 \\ 3.1_3 & 3.2_2 & 3.3_{2,3} \end{array} \right)$$

we recognize that in each triad and in each trichotomy the sub-signs are pairwise connected by their inner semiotic environment. It follows that there

are no triadic sign relations, which are not connected by their inner semiotic environments. This is especially important for sign relations which are neither connected by static sub-signs nor by dynamic semioses, f. ex.:

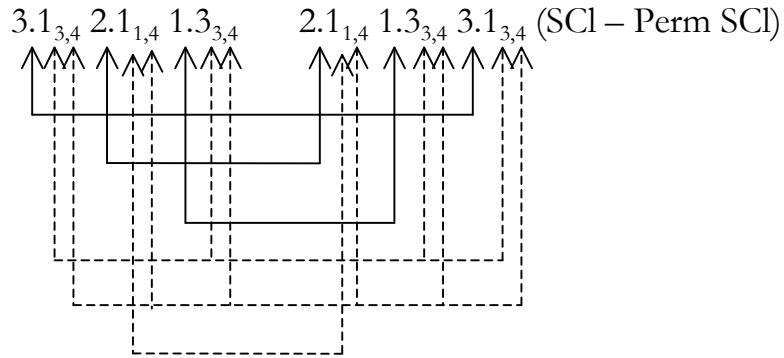


The three sign classes in this example have no other than inner environmental semiotic connections.

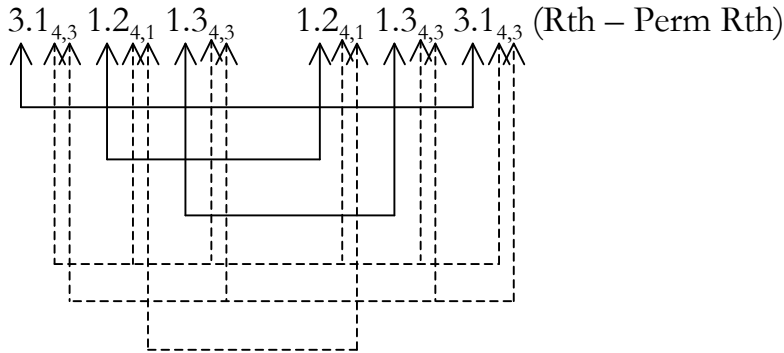
This simple fact has tremendous consequences for the semiotic universe. Since there are pairs of sign classes, which have neither static nor dynamic connection, the conclusion was made that the semiotic universe is topologically non-connected. However, from a polycontextural standpoint, we can “save” the Peircean idea of the semiotic connectedness of the world. Even in those cases, when an n-tuple of sign classes is topologically non-connected by sub-signs and/or semioses, it is necessarily connected through the internal semiotic environments of their sub-signs and/or semioses. In other words: Any n-tuple of sign-classes is connected by the heteromorphisms, but not necessarily by the morphisms of their sub-signs involved (!).

Concluding this chapter, I give an example for each of the four possible combinations between sign classes, reality thematics and their permutations. Connections between sub-signs are straight, connections between environments are dashed.

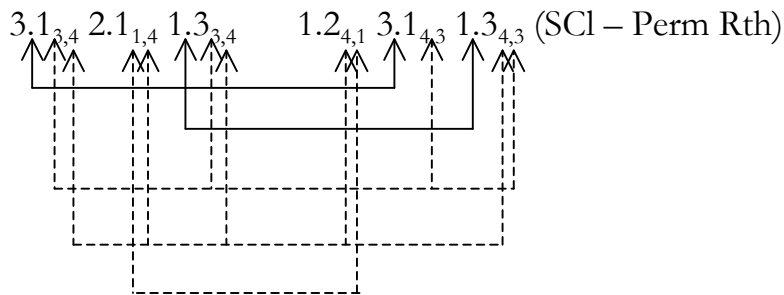
**1. Connections of sign classes and permutations of sign classes**



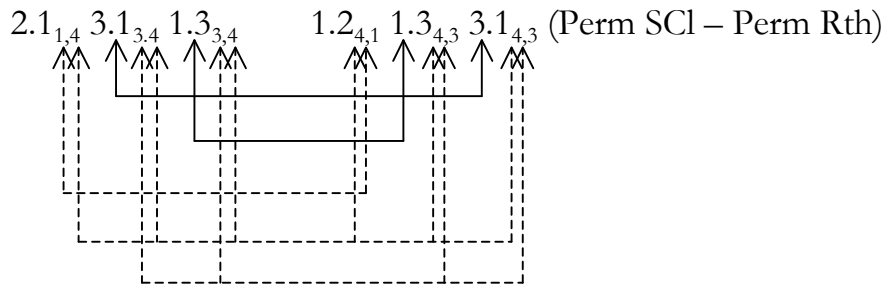
**2. Connections of reality thematics and permutations of reality thematics**



**3. Connections of sign classes and permutations of reality thematics**

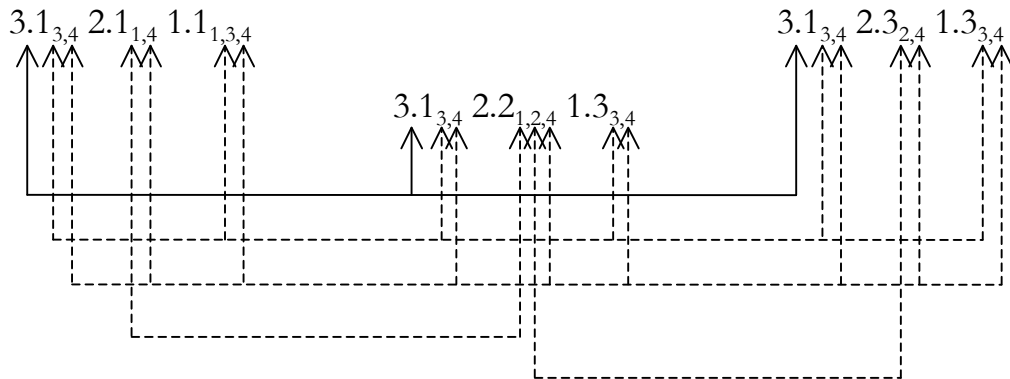


**4. Connections of permutations of sign classes and permutations of reality thematics**



Moreover, connections by inner environments also enlighten semiotic communication and creation schemata.

**5. Communication schemata** (cf. Bense 1971, pp. 39 ss.; Toth 1993, pp. 147 ss.)



**6. Creation schemata** (cf. Bense 1976, pp. 106 ss.; Toth 1993, pp. 158 ss.)

