Prof. Dr. Alfred Toth

Clockwise and counterclockwise semiotic paths

1. The idea to write this study originated in a discussion with my late friend, the fairground exhibitor Philippe Steiner (cf. Toth et al. 1999; Toth 2000). Philippe owned an old dark ride (also sometimes called ghost train as a calque from German Geisterbahn) through which the cars run counterclockwise, while in most modern dark rides, they run clockwise:

http://p3.focus.de/img/gen/e/q/HBeq5DT9_Pxgen_r_467xA.jpg

Counterclockwise instead of clockwise orientation is also used in mathematics, e.g., in counting the quadrants of a Cartesian coordinate system, in the labeling of ordered graphs, etc. Moreover, the entrance of most American food stores is to the right, while the exit is to the left for a person who stands in front of the store. Once entered, this person is directed by the architecture of the store to proceed his path through in counterclockwise direction. Would he decide to choose a clockwise path, then he had to navigate himself through the lines of the people standing in front of the cash registers which are situated between the entrance and the exist of the store.

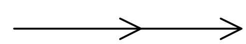
Thus, the question arises if the space concepts of dark rides gave the model for the space concepts in supermarkets or vice versa. As a matter of fact, the stores of the former Swiss chain "Pick Pay" were constructed accurately according to the basic space concept of dark rides: To reach a maximum of length of the path between entrance and exit by as many curves as possible in a pre-given limited space. Needless to say that the paths through the Pick-Pay stores were also counterclockwise. Moreover, in a Pick Pay store, it was impossible to pass by somebody in front of you with the cart, because the paths were corridors hemmed by the shelves. In dark rides, the order of the cars to drive is successive and never simultaneous, too. In Pick Pay stores, it was normally not possible to see somebody passing by in a parallel corridor. In ghost trains, dark screens shield parallel corridors from one another.

Generally, one may say that the smaller the surface of a dark ride is, the easier it can be transported from fairground to fairground, but, at the same time, the more curves have to be constructed in order to reach the maximal time to drive through. The smaller a supermarket is, the curvier its main path has to be in order to displaying a maximal amount of goods. Thus, both in the case of dark rides and in the case of supermarkets, the principle is optimization. Yet, the question stands why newer supermarkets and older dark rides seem to prefer counterclockwise orientation. The often quoted reason, that the dark rides took over their counterclockwise orientation from the older carrousels, in which the direction goes back to the 18th century custom of sticking with a sword into a ring that was fixed on the middle beam of the first carrousels (cf. Dering 1986), is possibly wrong, since then the sticking had to be done left-handed.

2. At the hand of the transpositions of sign classes and reality thematics and their respective cyclic groups (Toth 2008d), in the present study, I will show all possible cycles of transpositions concerning the clockwise or counterclockwise orientation of their semioses. It turns out that counterclockwise orientation appears to be the more "natural" orientation on the level of deepest semiotic representation and thus a sign-theoretic ordering type that is common to all phenomena discussed above, and many more, which are related to the general concept of chirality. This study continues my basic theory of paths ("tracks") in "Semiotic Ghost Trains" (Toth 2008a) as well as my attempts for a semiotics of time (Toth 2008b, c).

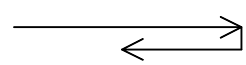
3. First, we introduce the 6 possible order types for each sign class and reality thematics. As a concrete example, we will use the sign class (3.1 2.1 1.3) and its dual reality thematic (3.1 1.2 1.3). Then, we show the different order types using a simple system of arrows and give the respective 2 · 6 possible transpositions also in category theoretic notation:

1. $(3.) \rightarrow (2.) \rightarrow (1.) \times (.1) \leftarrow (.2) \leftarrow (.3)$
   (3.1 2.1 1.3) × (3.1 1.2 1.3)
   $[[\beta°, id1], [\alpha°, \beta\alpha]] \times [[\alpha°\beta°, \alpha], [id1, \beta]]$



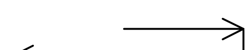
Order type: rightward

2. $(3.) \rightarrow (1.) \rightarrow (2.) \times (.2) \leftarrow (.1) \leftarrow (.3)$
   (3.1 1.3 2.1) × (1.2 3.1 1.3)
   $[[\alpha°\beta°, \beta\alpha], [\alpha, \alpha°\beta°]] \times [[\beta\alpha, \alpha°], [\alpha°\beta°, \beta\alpha]]$



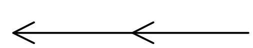
Order type: clockwise

3. $(2.) \rightarrow (1.) \rightarrow (3.) \times (.3) \leftarrow (.1) \leftarrow (.2)$
   (2.1 1.3 3.1) × (1.3 3.1 1.2)
   $[[\alpha°, \beta\alpha], [\beta\alpha, \alpha°\beta°]] \times [[\beta\alpha, \alpha°\beta°, \alpha°\beta°, \alpha]]$



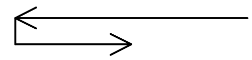
Order type: clockwise

4. $(1.) \rightarrow (2.) \rightarrow (3.) \times (.3) \leftarrow (.2) \leftarrow (.1)$
   (1.3 2.1 3.1) × (1.3 1.2 3.1)
   $[[\alpha, \alpha°\beta°], [\beta, id1]] \times [[id1, \beta°], [\beta\alpha, \alpha°]]$



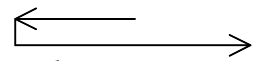
Order type: leftward

5. (1.) → (3.) → (2.) × (.2) ← (.3) ← (.1)
   (1.3 3.1 2.1) × (1.2 1.3 3.1)
   $[[\beta\alpha, \alpha^\circ\beta^\circ], [\beta^\circ, id1]] \times [[id1, \beta], [\beta\alpha, \alpha^\circ\beta^\circ]]$



Order type: counterclockwise

6. (2.) → (3.) → (1.) × (.1) ← (.3) ← (.2)
   (2.1 3.1 1.3) × (3.1 1.3 1.2)
   $[[\beta, id1], [\alpha^\circ\beta^\circ, \beta\alpha]] \times [[\alpha^\circ\beta^\circ, \beta\alpha], [id1, \beta^\circ]]$

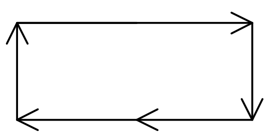


Order type: counterclockwise

All possible cases of finite and infinite semiotic cycles can be ordered in 3 groups:

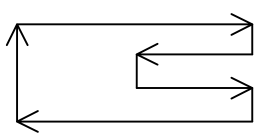
1st semiotic cycle:

1. (3.1 2.1 1.3) → (1.3 2.1 3.1) → (3.1 2.1 1.3)



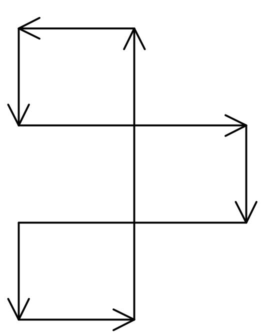
This finite order type is strictly clockwise.

2. (3.1 1.3 2.1) → (2.1 1.3 3.1) → (3.1 1.3 2.1) → ∞



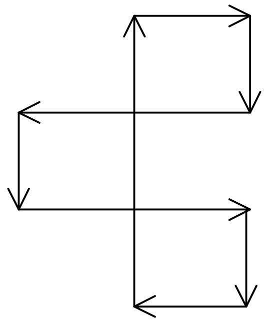
This infinite order type is clockwise, but with one counterclockwise detour.

3. (2.1 3.1 1.3) → (1.3 3.1 2.1) → (2.1 3.1 1.3) → ∞



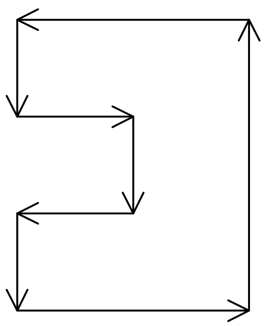
This infinite order type is basically counterclockwise, but with two clockwise detours.

4. (2.1 1.3 3.1) → (3.1 1.3 2.1) → (2.1 1.3 3.1) → ∞



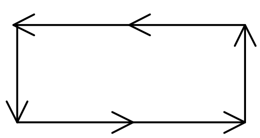
This infinite order type is basically clockwise, but with two counterclockwise detours.

5. (1.3 3.1 2.1) → (2.1 3.1 1.3) → (1.3 3.1 2.1) → ∞



This infinite order type is basically counterclockwise, but with two clockwise detours.

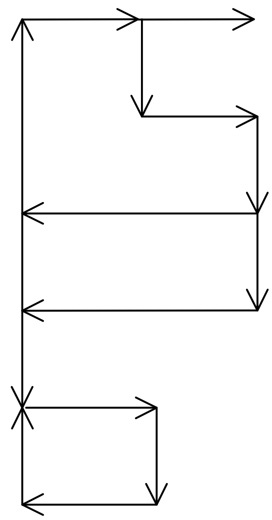
6. (1.3 2.1 3.1) → (3.1 2.1 1.3) → (1.3 2.1 3.1) → ∞



This infinite order type is strictly counterclockwise.

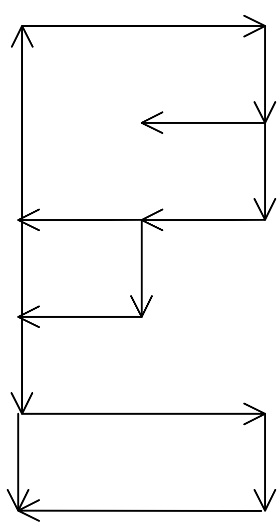
2nd semiotic cycle:

1. (3.1 2.1 1.3) → (2.1 1.3 3.1) → (1.3 3.1 2.1) → (3.1 2.1 1.3)



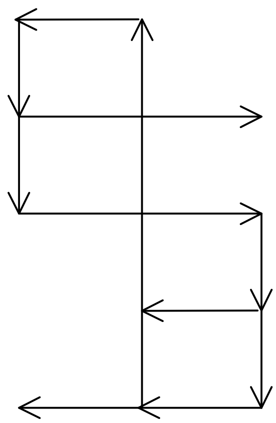
This finite order type is basically clockwise, but with three counterclockwise detours.

2. (3.1 1.3 2.1) → (1.3 2.1 3.1) → (2.1 3.1 1.3) → (3.1 1.3 2.1) → ∞



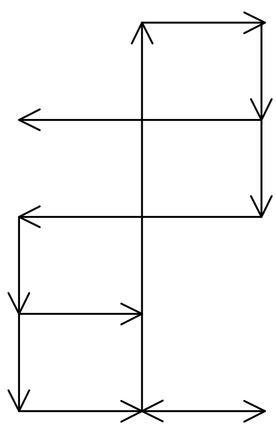
This infinite order type is basically clockwise, but with four counterclockwise detours.

3. (2.1 3.1 1.3) → (3.1 1.3 2.1) → (1.3 2.1 3.1) → (2.1 3.1 1.3) → ∞



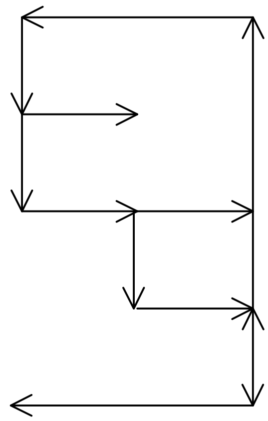
This infinite order type is basically counterclockwise, but with two clockwise detours.

4. (2.1 1.3 3.1) → (1.3 3.1 2.1) → (3.1 2.1 1.3) → (2.1 1.3 3.1)



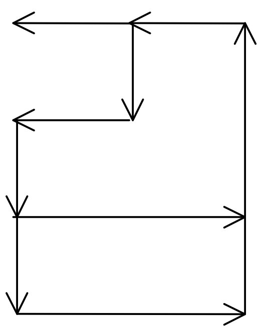
This finite order type is basically clockwise, but with three counterclockwise detours.

5. (1.3 3.1 2.1) → (3.1 2.1 1.3) → (2.1 1.3 3.1) → (1.3 3.1 2.1)



This finite order type is basically counterclockwise, but with three clockwise detours.

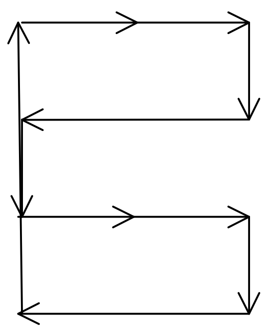
6. (1.3 2.1 3.1) → (2.1 3.1 1.3) → (3.1 1.3 2.1) → (1.3 2.1 3.1) → ∞



This infinite order type is basically counterclockwise, but with two clockwise detours.

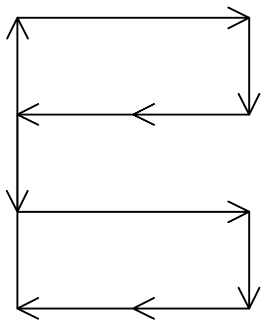
3rd semiotic cycle:

1. (3.1 2.1 1.3) → (1.3 3.1 2.1) → (2.1 1.3 3.1) → (3.1 2.1 1.3)



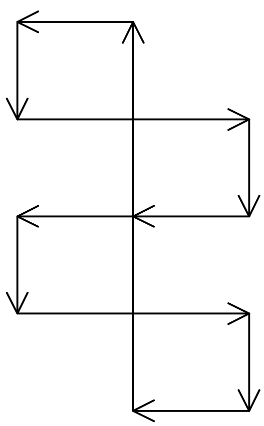
This finite order type is basically clockwise, but with two counterclockwise detours.

2. (3.1 1.3 2.1) → (2.1 3.1 1.3) → (1.3 2.1 3.1) → (3.1 1.3 2.1) → ∞



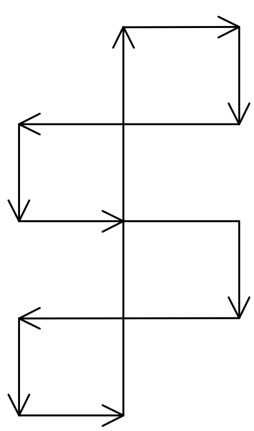
This infinite order type is basically clockwise, but with two counterclockwise detours.

3. (2.1 3.1 1.3) → (1.3 2.1 3.1) → (3.1 1.3 2.1) → (2.1 3.1 1.3) → ∞



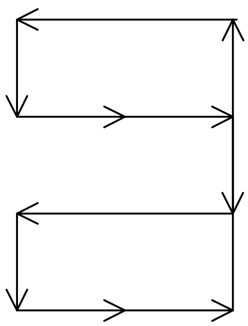
This infinite order type is basically counterclockwise, but with two clockwise detours.

4. (2.1 1.3 3.1) → (3.1 2.1 1.3) → (1.3 3.1 2.1) → (2.1 1.3 3.1)



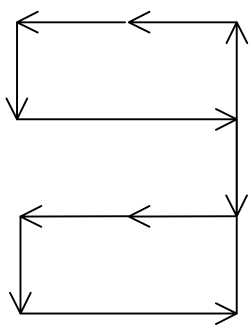
This finite order type is basically clockwise, but with two counterclockwise detours.

5. (1.3 3.1 2.1) → (2.1 1.3 3.1) → (3.1 2.1 1.3) → (1.3 3.1 2.1)



This finite order type is basically counterclockwise, but with two clockwise detours.

6. (1.3 2.1 3.1) → (3.1 1.3 2.1) → (2.1 3.1 1.3) → (1.3 2.1 3.1) → ∞



This infinite order type is basically counterclockwise, but with two clockwise detours.

4. As we recognize, paths that are oriented counterclockwise, are slightly in the overweight over paths that are oriented clockwise insofar as the leftward semioses are concerned. The above 3 semiotic cycles and their 6 order types each show all basic types of semiotic cyclic groups with finite and infinite cycles, whereby the orientation of the paths is uniformly distributed over the 3 semiotic cycles. Thus, the difference between leftward and rightward orientation, parallel and antiparallel structures, chirality, and related structures are already present on the deepest representation level of semiotics.[1] This study therefore confirms the results of Ertekin Arin from architecture semiotics, especially about "adaptation iconism" (Arin 1981, pp. 280 ss.; Arin 1984).

1 Nevertheless, the priority of right before left, up before down, etc. seems to be a culturally determined phenomenon, as, e.g. ungrammatical English "binomials" like "left and right", "down and up", "fro and to", etc. show – quite opposite, e.g. to Hawaiian and other Polynesian languages (cf. Elbert and Pukui 1979; Toth 2008e).

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