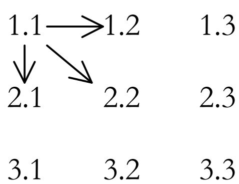
**Prof. Dr. Alfred Toth**

# Semiotic covalent bonds

1. In Toth (2008a) and (2008b), it has been shown that chemical bonds are somewhat related to sign connections, which therefore have been called "semiotic bonds". In the present study, we will investigate the major types of covalent semiotic bonds.

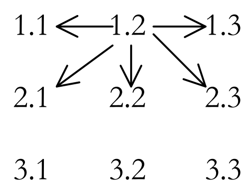
2. Sign classes consist of dyadic sub-signs whose semiotic bonds are quite different from the bonds of the sign classes (cf. Toth 2008b). First, we show the semiotic bonds of the 9 sub-signs of the semiotic matrix and indicate the semiotic valency (SV) of each sub-sign:

Semiotic bonds of the Quali-Sign (1.1):



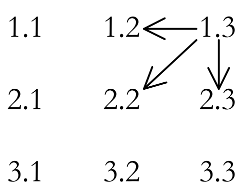

SV(1.1) = 3

Semiotic bonds of the Sin-Sign (1.2):



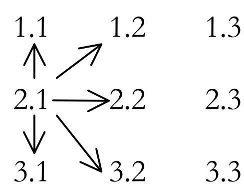

SV(1.2) = 5

Semiotic bonds of the Legi-Sign (1.3):



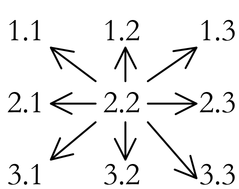

SV(1.3) = 3

Semiotic bonds of the Icon (2.1):



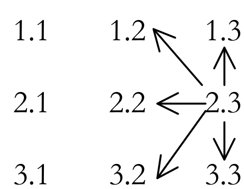

SV(2.1) = 5

Semiotic bonds of the Index (2.2):



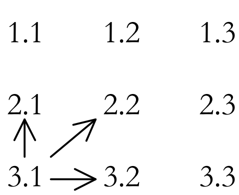

SV(2.2) = 9

Semiotic bonds of the Symbol (2.3):



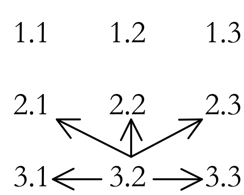

SV(2.3) = 5

Semiotic bonds of the Rhema (3.1):



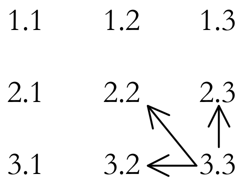

SV(3.1) = 3

Semiotic bonds of the Dicent (3.2):




SV(3.2) = 5

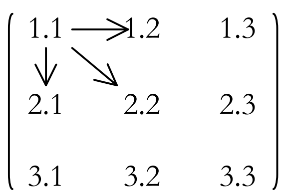
Semiotic bonds of the Argument (3.3):




SV(3.3) = 3

3. Thus, each sub-sign has valency 3, 5, or 8 and can therefore enter sign-classes, which contain those sub-signs, which are bound by the respective sub-signs. In the following, we will thus assign the set of sign classes to each sub-sign according to its semiotic bonding and valency.

3.1. Bonding-set of sign classes for (1.1)

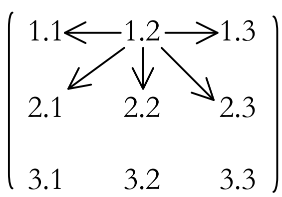



SV = 3

→ {(3.1 2.1 1.1), (3.2 2.2 1.2)
(3.1 2.1 1.2), (3.2 2.2 1.3)
(3.1 2.2 1.2)
(3.1 2.1 1.3)
(3.1 2.2 1.3)}

SV = 7

3.2. Bonding-set of sign classes for (1.2)

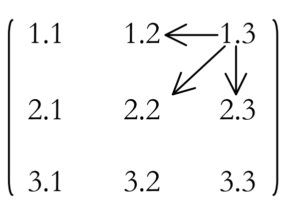



SV = 5

→ {(3.1 2.1 1.1), (3.1 2.3 1.3)
(3.1 2.1 1.2), (3.2 2.2 1.2)
(3.1 2.1 1.3), (3.2 2.2 1.3)
(3.1 2.2 1.2), (3.2 2.3 1.3)
(3.1 2.2 1.3), (3.3 2.3 1.3)}

SV = 10

3.3. Bonding-set of sign classes for (1.3)

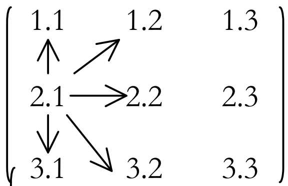



SV = 3

→ {(3.1 2.2 1.2), (3.2 2.3 1.3)
(3.1 2.2 1.3), (3.3 2.3 1.3)
(3.1 2.3 1.3)
(3.2 2.2 1.2)
(3.2 2.2 1.3)}

SV = 7

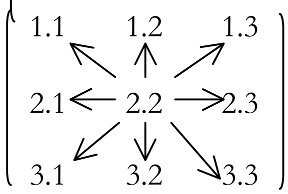
3.4. Bonding-set of sign classes for (2.1)




→ { (3.1 2.1 1.1), (3.1 2.1 1.2), (3.1 2.2 1.2), (3.2 2.2 1.2) }

SV = 5 SV = 4

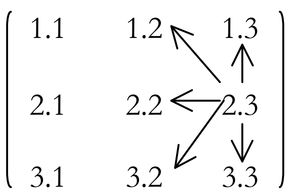
3.5. Bonding-set of sign classes for (2.2)




→ { (3.1 2.1 1.1), (3.1 2.3 1.3)
(3.1 2.1 1.2), (3.2 2.2 1.2)
(3.1 2.1 1.3), (3.2 2.2 1.3)
(3.1 2.2 1.2), (3.2 2.3 1.3)
(3.1 2.2 1.3), (3.3 2.3 1.3) }

SV = 9 SV = 10

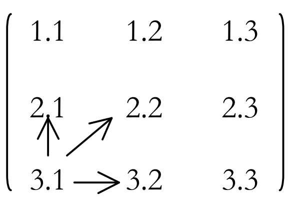
3.6. Bonding-set of sign classes for (2.3)




→ { (3.2 2.2 1.2), (3.2 2.2 1.3), (3.2 2.3 1.3), (3.3 2.3 1.3) }

SV = 5 SV = 4

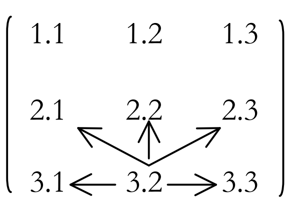
3.7. Bonding-set of sign classes for (3.1)




→ { (3.1 2.1 1.1), (3.1 2.1 1.2), (3.1 2.2 1.2), (3.2 2.2 1.2) }

SV = 3 SV = 4

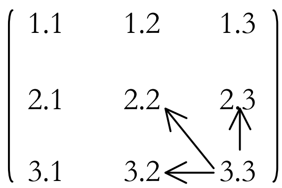
3.8. Bonding-set of sign classes for (3.2)




→ { (3.1 2.1 1.1), (3.1 2.3 1.3)
(3.1 2.1 1.2), (3.2 2.2 1.2)
(3.1 2.1 1.3), (3.2 2.2 1.3)
(3.1 2.2 1.2), (3.2 2.3 1.3)
(3.1 2.2 1.3), (3.3 2.3 1.3) }

SV = 5 SV = 10

3.9. Bonding-set of sign classes for (3.3)



SV = 3

→

$$\left\{\begin{matrix}(3.2\ 2.2\ 1.2)\\(3.2\ 2.2\ 1.3)\\(3.2\ 2.3\ 1.3)\\(3.3\ 2.3\ 1.3)\end{matrix}\right\}$$

SV = 4

4. Now, we will compare the 9 binding sets that we assigned to the 9 sub-signs. As abbreviations we shall use BS(1.1), ..., BS(3.3):

BS(1.1) = {(3.1 2.1 1.1), (3.2 2.2 1.2), (3.1 2.1 1.2), (3.2 2.2 1.3), (3.1 2.2 1.2), (3.1 2.1 1.3), (3.1 2.2 1.3)}
BS(1.2) = {(3.1 2.1 1.1), (3.1 2.3 1.3), (3.1 2.1 1.2), (3.2 2.2 1.2), (3.1 2.1 1.3), (3.2 2.2 1.3), (3.1 2.2 1.2), (3.2 2.3 1.3), (3.1 2.2 1.3), (3.3 2.3 1.3)}
BS(1.3) = {(3.1 2.2 1.2), (3.2 2.3 1.3), (3.1 2.2 1.3), (3.3 2.3 1.3), (3.1 2.3 1.3), (3.2 2.2 1.2), (3.2 2.2 1.3)}
BS(2.1) = {(3.1 2.1 1.1), (3.1 2.1 1.2), (3.1 2.2 1.2), (3.2 2.2 1.2)}
BS(2.2) = {(3.1 2.1 1.1), (3.1 2.3 1.3), (3.1 2.1 1.2), (3.2 2.2 1.2), (3.1 2.1 1.3), (3.2 2.2 1.3), (3.1 2.2 1.2), (3.2 2.3 1.3), (3.1 2.2 1.3), (3.3 2.3 1.3)}
BS(2.3) = {(3.2 2.2 1.2), (3.2 2.2 1.3), (3.2 2.3 1.3), (3.3 2.3 1.3)}
BS(3.1) = {(3.1 2.1 1.1), (3.1 2.1 1.2), (3.1 2.2 1.2), (3.2 2.2 1.2)}
BS(3.2) = {(3.1 2.1 1.1), (3.1 2.3 1.3), (3.1 2.1 1.2), (3.2 2.2 1.2), (3.1 2.1 1.3), (3.2 2.2 1.3), (3.1 2.2 1.2), (3.2 2.3 1.3), (3.1 2.2 1.3), (3.3 2.3 1.3)}
BS(3.3) = {(3.2 2.2 1.2), (3.2 2.2 1.3), (3.2 2.3 1.3), (3.3 2.3 1.3)}

As a result, we note that although BS(1.1) ≠ (1.2) ≠ ... ≠ (3.3), we obtain:

BS(1.2) = BS(2.2) = BS(3.2)
BS(2.1) = BS(3.1)
BS(2.3) = BS(3.3)

**Bibliography**


Toth, Alfred, Semiotic valence numbers of monads, dyads and triads. Ch. 18 (2008a)
Toth, Alfred, Bond structures of sign classes. Ch. 19 (2008b)