

Prof. Dr. Alfred Toth

Abbildung von Situationsklassen auf ihre Redukte

1. Wir gehen aus von der allgemeinen Form semiotischer Dualsysteme

$$\text{DS: } \text{ZKI} = (3.x, 2.y, 1.z) \times \text{RTh} = (z.1, y.2, x.3),$$

bilden sie auf ihre situationalen Trajektklassen, kurz Situationsklassen (vgl. Toth 2025a) genannt, ab

$$3_A.x_A \quad \underline{2}_R.y_R \quad 1_I.z_I \rightarrow 3_A.\underline{2}_R \quad x_A.y_R \quad | \quad \underline{2}_R.1_I \quad y_R.z_I$$

$$z_A.1_A \quad y_R.\underline{2}_R \quad x_I.3_I \rightarrow z_A.y_R \quad 1_A.\underline{2}_R \quad | \quad y_R.x_I \quad \underline{2}_R.3_I$$

und erhalten damit folgendes Trajekt-Dualsystem:

$$\text{DST: } \text{ZKI}^T = (3_A.\underline{2}_R, x_A.y_R | \underline{2}_R.1_I, y_R.z_I) \times \text{RTh}^T = (z_A.y_R, 1_A.\underline{2}_R | y_R.x_I, \underline{2}_R.3_I)$$

$$\text{mit } \text{Sit} = (x_A.y_R | \underline{2}_R.1_I), U^{lo} = (3_A.\underline{2}_R) \text{ und } U^{ro} = (y_R.z_I).$$

Reduzierte Situationsklassen entstehen aus Situationsklassen, indem zusätzlich die Umgebungen U^{lo} und U^{ro} verschränkt werden (vgl. Toth 2025b, c).

2. In den folgenden 27 Dualsystemen des vollständigen ternären semiotischen Systems stehen jeweils in der ersten Zeile die Situationsklassen und in der zweiten Zeile ihre Redukte. Die Abbildungen gehen aus der durch Farben markierten Distribution der verschränkten Subzeichen hervor.

1. Dualsystem

$$(3_A.2_R, 1_A.1_R | 2_R.1_I, 1_R.1_I) \times (1_A.1_R, 1_A.2_R | 1_R.1_I, 2_R.3_I) \\ ((1_A.1_R | 2_R.1_I), (3_A.1_R | 2_R.1_I)) \times ((1_A.2_R | 1_R.1_I), (1_A.2_R | 1_R.3_I))$$

2. Dualsystem

$$(3_A.2_R, 1_A.1_R | 2_R.1_I, 1_R.2_I) \times (2_A.1_R, 1_A.2_R | 1_R.1_I, 2_R.3_I) \\ ((1_A.1_R | 2_R.1_I), (3_A.1_R | 2_R.2_I)) \times ((1_A.2_R | 1_R.1_I), (2_A.2_R | 1_R.3_I))$$

3. Dualsystem

$$(3_A.2_R, 1_A.1_R | 2_R.1_I, 1_R.3_I) \times (3_A.1_R, 1_A.2_R | 1_R.1_I, 2_R.3_I) \\ ((1_A.1_R | 2_R.1_I), (3_A.1_R | 2_R.3_I)) \times ((1_A.2_R | 1_R.1_I), (3_A.2_R | 1_R.3_I))$$

4. Dualsystem

$$(3_A.2_R, 1_A.2_R | 2_R.1_I, 2_R.1_I) \times (1_A.2_R, 1_A.2_R | 2_R.1_I, 2_R.3_I) \\ ((1_A.2_R | 2_R.1_I), (3_A.2_R | 2_R.1_I)) \times ((1_A.2_R | 2_R.1_I), (1_A.2_R | 2_R.3_I))$$

5. Dualsystem

$$(3_A.2_R, 1_A.2_R \mid 2_R.1_I, 2_R.2_I) \times (2_A.2_R, 1_A.2_R \mid 2_R.1_I, 2_R.3_I) \\ ((1_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 2_R.1_I), (2_A.2_R \mid 2_R.3_I))$$

6. Dualsystem

$$(3_A.2_R, 1_A.2_R \mid 2_R.1_I, 2_R.3_I) \times (3_A.2_R, 1_A.2_R \mid 2_R.1_I, 2_R.3_I) \\ ((1_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.3_I))$$

7. Dualsystem

$$(3_A.2_R, 1_A.3_R \mid 2_R.1_I, 3_R.1_I) \times (1_A.3_R, 1_A.2_R \mid 3_R.1_I, 2_R.3_I) \\ ((1_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 3_R.1_I), (1_A.2_R \mid 3_R.3_I))$$

8. Dualsystem

$$(3_A.2_R, 1_A.3_R \mid 2_R.1_I, 3_R.2_I) \times (2_A.3_R, 1_A.2_R \mid 3_R.1_I, 2_R.3_I) \\ ((1_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 3_R.1_I), (2_A.2_R \mid 3_R.3_I))$$

9. Dualsystem

$$(3_A.2_R, 1_A.3_R \mid 2_R.1_I, 3_R.3_I) \times (3_A.3_R, 1_A.2_R \mid 3_R.1_I, 2_R.3_I) \\ ((1_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 3_R.1_I), (3_A.2_R \mid 3_R.3_I))$$

10. Dualsystem

$$(3_A.2_R, 2_A.1_R \mid 2_R.1_I, 1_R.1_I) \times (1_A.1_R, 1_A.2_R \mid 1_R.2_I, 2_R.3_I) \\ ((2_A.1_R \mid 2_R.1_I), (3_A.1_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 1_R.2_I), (1_A.2_R \mid 1_R.3_I))$$

11. Dualsystem

$$(3_A.2_R, 2_A.1_R \mid 2_R.1_I, 1_R.2_I) \times (2_A.1_R, 1_A.2_R \mid 1_R.2_I, 2_R.3_I) \\ ((2_A.1_R \mid 2_R.1_I), (3_A.1_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 1_R.2_I), (2_A.2_R \mid 1_R.3_I))$$

12. Dualsystem

$$(3_A.2_R, 2_A.1_R \mid 2_R.1_I, 1_R.3_I) \times (3_A.1_R, 1_A.2_R \mid 1_R.2_I, 2_R.3_I) \\ ((2_A.1_R \mid 2_R.1_I), (3_A.1_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 1_R.2_I), (3_A.2_R \mid 1_R.3_I))$$

13. Dualsystem

$$(3_A.2_R, 2_A.2_R \mid 2_R.1_I, 2_R.1_I) \times (1_A.2_R, 1_A.2_R \mid 2_R.2_I, 2_R.3_I) \\ ((2_A.y_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 2_R.2_I), (1_A.2_R \mid 2_R.3_I))$$

14. Dualsystem

$$(3_A.2_R, 2_A.2_R \mid 2_R.1_I, 2_R.2_I) \times (2_A.2_R, 1_A.2_R \mid 2_R.2_I, 2_R.3_I) \\ ((2_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 2_R.2_I), (2_A.2_R \mid 2_R.3_I))$$

15. Dualsystem

$$(3_A.2_R, 2_A.2_R \mid 2_R.1_I, 2_R.3_I) \times (3_A.2_R, 1_A.2_R \mid 2_R.2_I, 2_R.3_I) \\ ((2_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 2_R.2_I), (3_A.2_R \mid 2_R.3_I))$$

16. Dualsystem

$$(3_A.2_R, 2_A.3_R \mid 2_R.1_I, 3_R.1_I) \times (1_A.3_R, 1_A.2_R \mid 3_R.2_I, 2_R.3_I) \\ ((2_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 3_R.2_I), (1_A.2_R \mid 3_R.3_I))$$

17. Dualsystem

$$(3_A.2_R, 2_A.3_R \mid 2_R.1_I, 3_R.2_I) \times (2_A.3_R, 1_A.2_R \mid 3_R.2_I, 2_R.3_I) \\ ((2_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 3_R.2_I), (2_A.2_R \mid 3_R.3_I))$$

18. Dualsystem

$$(3_A.2_R, 2_A.3_R \mid 2_R.1_I, 3_R.3_I) \times (3_A.3_R, 1_A.2_R \mid 3_R.2_I, 2_R.3_I) \\ ((2_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 3_R.2_I), (3_A.2_R \mid 3_R.3_I))$$

19. Dualsystem

$$(3_A.2_R, 3_A.1_R \mid 2_R.1_I, 1_R.1_I) \times (1_A.1_R, 1_A.2_R \mid 1_R.3_I, 2_R.3_I) \\ ((3_A.1_R \mid 2_R.1_I), (3_A.1_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 1_R.3_I), (1_A.2_R \mid 1_R.3_I))$$

20. Dualsystem

$$(3_A.2_R, 3_A.1_R \mid 2_R.1_I, 1_R.2_I) \times (2_A.1_R, 1_A.2_R \mid 1_R.3_I, 2_R.3_I) \\ ((3_A.1_R \mid 2_R.1_I), (3_A.1_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 1_R.3_I), (2_A.2_R \mid 1_R.3_I))$$

21. Dualsystem

$$(3_A.2_R, 3_A.1_R \mid 2_R.1_I, 1_R.3_I) \times (3_A.1_R, 1_A.2_R \mid 1_R.3_I, 2_R.3_I) \\ ((3_A.1_R \mid 2_R.1_I), (3_A.1_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 1_R.3_I), (3_A.2_R \mid 1_R.3_I))$$

22. Dualsystem

$$(3_A.2_R, 3_A.2_R \mid 2_R.1_I, 2_R.1_I) \times (1_A.2_R, 1_A.2_R \mid 2_R.3_I, 2_R.3_I) \\ ((3_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 2_R.3_I), (1_A.2_R \mid 2_R.3_I))$$

23. Dualsystem

$$(3_A.2_R, 3_A.2_R \mid 2_R.1_I, 2_R.2_I) \times (2_A.2_R, 1_A.2_R \mid 2_R.3_I, 2_R.3_I) \\ ((3_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 2_R.3_I), (2_A.2_R \mid 2_R.3_I))$$

24. Dualsystem

$$(3_A.2_R, 3_A.2_R \mid 2_R.1_I, 2_R.3_I) \times (3_A.2_R, 1_A.2_R \mid 2_R.3_I, 2_R.3_I) \\ ((3_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 2_R.3_I), (3_A.2_R \mid 2_R.3_I))$$

25. Dualsystem

$$(3_A.2_R, 3_A.3_R \mid 2_R.1_I, 3_R.1_I) \times (1_A.3_R, 1_A.2_R \mid 3_R.3_I, 2_R.3_I) \\ ((3_A.2_R \mid 2_R.1_I), (3_A.2_R \mid 2_R.1_I)) \times ((1_A.2_R \mid 2_R.3_I), (1_A.3_R \mid 2_R.3_I))$$

26. Dualsystem

$$(3_A.2_R, 3_A.3_R \mid 2_R.1_I, 3_R.2_I) \times (2_A.3_R, 1_A.2_R \mid 3_R.3_I, 2_R.3_I) \\ ((3_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.2_I)) \times ((1_A.2_R \mid 3_R.3_I), (2_A.2_R \mid 3_R.3_I))$$

27. Dualsystem

$$(3_A.2_R, 3_A.3_R \mid 2_R.1_I, 3_R.3_I) \times (3_A.3_R, 1_A.2_R \mid 3_R.3_I, 2_R.3_I) \\ ((3_A.3_R \mid 2_R.1_I), (3_A.3_R \mid 2_R.3_I)) \times ((1_A.2_R \mid 3_R.3_I), (3_A.2_R \mid 3_R.3_I))$$

Literatur

Toth, Alfred, Semiotische Situationsklassen und ihre Dualen. In: Electronic Journal for Mathematical Semiotics, 2025a

Toth, Alfred, Reduzierte Situationsklassen. In: Electronic Journal for Mathematical Semiotics, 2025b

Toth, Alfred, Dualsysteme, Situationssysteme und reduzierte Situationssysteme. In: Electronic Journal for Mathematical Semiotics, 2025c

4.1.2026