A graphical notation for HPSG-style sort hierarchies

Detmar Meurers
University of Tübingen
dm@earley.sns.neuphilologie.uni-tuebingen.de

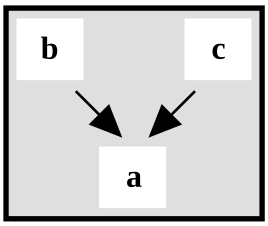
November 3, 1992

In HPSG the sort hierarchy and the appropriateness conditions for sorts form the main data structure for expressing linguistic knowledge. The linguist working with such a formalism needs to be able to visualize the overall architecture of the theory under development. On the following pages a graphical notation for HPSG-style sort hierarchies is introduced, which is intended to help the linguist in the quest for a beautiful theory.

The graphical notations are shown together with an explanation of the construct depicted. In addition the corresponding notation from the appendix of Pollard & Sag (1993) is noted.

1 The Sort Hierarchy

The sort a is supersort of sorts b and c. Or, expressed the other way around: sort b is subsort of sort a, and sort c is subsort of sort a:



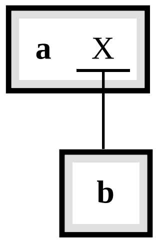
1.0.1 Corresponding Notation from P&S

Partition of a: b, c

2 Appropriateness Conditions

2.1 The simple case

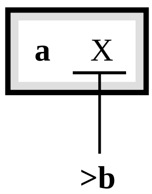
An object of sort a having the appropriate feature X whose feature-value is of sort b:



2.1.1 Corresponding Notation from P&S

a: $\left[\ \text{X} \quad b\ \right]$[1]

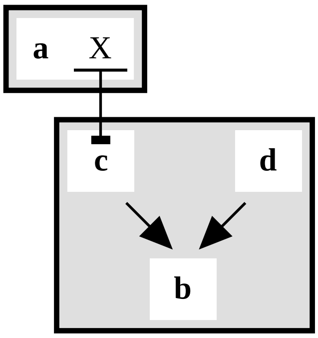
If the sort b has already been introduced in the diagram the following notation is also available:



[1]Here and in the following, only the appropriateness conditions are noted. If no other information about the sort hierarchy is given, the sorts in the diagrams should just be introduced as partitions of a top sort. Note that in the figure *HPSG Sort Hierarchy: HPSG II - Appendix* the top sort *object* is not included. Since the reason for the existence of the sort *object* is mathematical in nature, leaving it out of the diagram should not pose any problem for linguists.

2.2 Subsorts

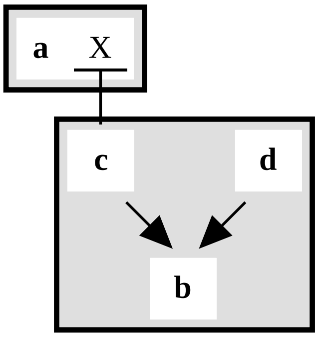
A sort with a feature X whose value is of subsort c of another sort b:



2.2.1 Corresponding Notation from P&S

Partition of b: c, d
a: $\left[\ \mathrm{X} \quad c\ \right]$

The notation just introduced for features with subsorts as their appropriate sort should not be confused with



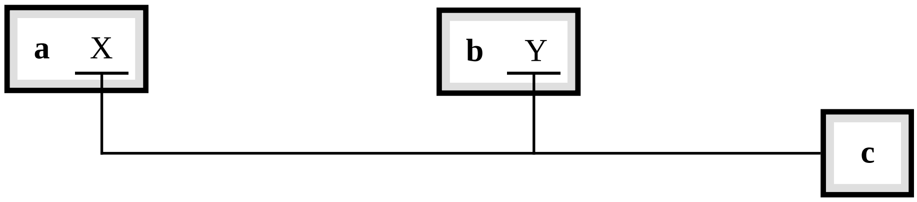
in which X takes an object of sort b (or of course one of its subsorts) as its value.

2.2.2 Corresponding Notation from P&S

Partition of b: c, d
a: $\left[\ \mathrm{X} \quad b\ \right]$

2.3 An abbreviation

If the values of two features are of the same sort, the links can be graphically joined:

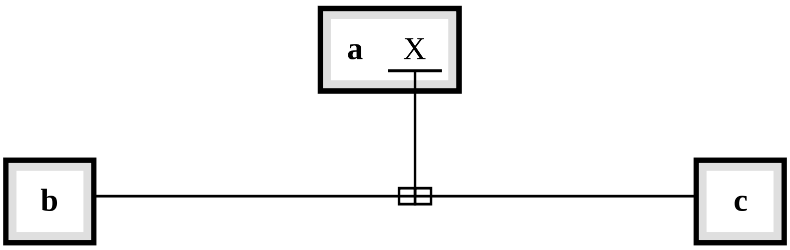


2.3.1 Corresponding Notation from P&S

a: $[\ \mathrm{X} \quad c\ ]$
b: $[\ \mathrm{Y} \quad c\ ]$

2.4 Features with disjunctive values

Objects of sort a have the appropriate feature X whose feature-value is of sort b or of sort c:

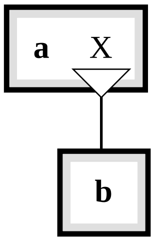


2.4.1 Corresponding Notation from P&S

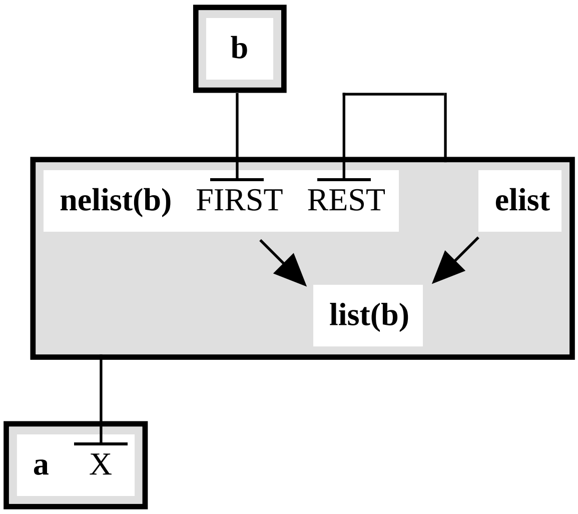
a: $[\ \mathrm{X} \quad b \vee c\ ]$

2.5 Features with list-values

An object of sort a having a feature X whose feature-value is a list of objects of sort b:



This is an abbreviation for the following:



2.5.1 Corresponding Notation from P&S

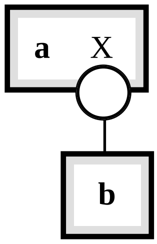
Partition of *list(σ)*: *nelist(σ)*, *elist*

$$nelist(\sigma)\text{:} \begin{bmatrix} \text{FIRST} & \sigma \\ \text{REST} & list(\sigma) \end{bmatrix}$$

$$a\text{:} \begin{bmatrix} \text{X} & \text{list}(b) \end{bmatrix}$$

2.6 Features with set-values

A feature X having a set of objects as its value:



2.6.1 Corresponding Notation from P&S

a: $\left[\ \mathrm{X} \quad \mathrm{set}(b)\ \right]$

References

[1] **Pollard, Carl & Ivan A. Sag (1993):** *Head-driven Phrase Structure Grammar.* To be published by: CSLI Publications & University of Chicago Press.