

Constraint-based Analysis

Solutions to Unification Exercises

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1 Exercises on unifying (= merging) feature structures

1. $\textit{word} \cup \textit{word} = \textit{word}$

2. $\textit{word} \cup \textit{linguistic-object} = \textit{word}$

3. $\textit{word} \cup \textit{phrase}$ is undefined

4. $\textit{phrase} \cup \textit{sign} = \textit{phrase}$

5. $\textit{word} \cup \begin{bmatrix} \textit{word} \\ \text{SYN } \textit{cat} \end{bmatrix} = \begin{bmatrix} \textit{word} \\ \text{SYN } \textit{cat} \end{bmatrix}$

6. $\textit{word} \cup \begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix} = \begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix}$

7. $\begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix} \cup \begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix} = \begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix}$

8. $\begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix} \cup \begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{pos} \end{bmatrix} \end{bmatrix} = \begin{bmatrix} \textit{word} \\ \text{SYN } \begin{bmatrix} \textit{cat} \\ \text{POS } \textit{v} \end{bmatrix} \end{bmatrix}$

9. $\left[\begin{array}{c} \text{word} \\ \text{SYN} \left[\begin{array}{c} \text{cat} \\ \text{POS } v \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN} \left[\begin{array}{c} \text{cat} \\ \text{POS } a \end{array} \right] \end{array} \right]$ is undefined

$$10. \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \textit{v} \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \textit{3s} \end{array} \right] \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \textit{3s} \end{array} \right] \end{array} \right] \end{array} \right]$$

$$11. \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{VFORM} \textit{fin} \end{array} \right] \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \textit{3s} \end{array} \right] \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \textit{3s} \\ \text{VFORM} \textit{fin} \end{array} \right] \end{array} \right] \end{array} \right]$$

$$12. \left[\begin{array}{c} \text{word} \\ \text{SYN} \left[\begin{array}{c} \text{cat} \\ \text{POS} \left[\begin{array}{c} v \\ \text{VFORM } fin \end{array} \right] \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN} \left[\begin{array}{c} \text{cat} \\ \text{POS} \left[\begin{array}{c} v \\ \text{VFORM } presp \end{array} \right] \end{array} \right] \end{array} \right] \text{ is undefined}$$

$$13. \left[\begin{array}{c} \text{word} \\ \text{SYN} \left[\begin{array}{c} \text{cat} \\ \text{POS} \left[\begin{array}{c} n \\ \text{CASE} \text{acc} \end{array} \right] \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN} \left[\begin{array}{c} \text{cat} \\ \text{POS} \left[\begin{array}{c} v \\ \text{VFORM} \text{presp} \end{array} \right] \end{array} \right] \end{array} \right] \right] \text{ is unde-} \\ \text{fined}$$

$$14. \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{n} \\ \text{CASE} \textit{acc} \end{array} \right] \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{n} \\ \text{AGR} \textit{fst-sg} \end{array} \right] \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{n} \\ \text{CASE} \textit{acc} \\ \text{AGR} \textit{fst-sg} \end{array} \right] \end{array} \right] \end{array} \right]$$

$$15. \left[\begin{array}{c} \text{word} \\ \text{SYN } \text{cat} \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} n \\ \text{AGR } \text{fst-sg} \\ \text{CASE } \text{nom} \end{array} \right] \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} n \\ \text{AGR } \text{fst-sg} \\ \text{CASE } \text{nom} \end{array} \right] \end{array} \right] \end{array} \right]$$

$$16. \left[\begin{array}{c} \text{word} \\ \text{SYN } \text{cat} \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} n \\ \text{AGR } \text{thd-sg} \\ \text{CASE } \text{nom} \end{array} \right] \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} n \\ \text{AGR } \text{thd-sg} \\ \text{CASE } \text{nom} \end{array} \right] \end{array} \right] \end{array} \right]$$

$$17. \text{non-thd-sg} \cup \text{fst-sg} = \text{fst-sg}$$

$$18. \text{non-thd-sg} \cup \text{agr} = \text{non-thd-sg}$$

$$19. \text{non-thd-sg} \cup \text{agr} \cup \text{fst-pl} = \text{fst-pl}$$

$$20. \text{non-thd-sg} \cup \text{thd-sg} \text{ is undefined}$$

$$21. \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } v \\ \text{COMPS } \langle \text{NP} \rangle \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} v \\ \text{AGR } 3s \end{array} \right] \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} v \\ \text{AGR } 3s \end{array} \right] \\ \text{COMPS } \langle \text{NP} \rangle \end{array} \right] \end{array} \right]$$

$$22. \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } v \\ \text{COMPS } \langle \text{NP}, \text{NP} \rangle \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} v \\ \text{AGR } \text{thd-sg} \end{array} \right] \\ \text{COMPS } \text{list} \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \text{word} \\ \text{SYN } \left[\begin{array}{c} \text{cat} \\ \text{POS } \left[\begin{array}{c} v \\ \text{AGR } \text{thd-sg} \end{array} \right] \\ \text{COMPS } \langle \text{NP}, \text{NP} \rangle \end{array} \right] \end{array} \right]$$

$$23. \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \quad \textit{v} \\ \text{COMPS} \quad \langle \text{NP}, \text{S} \rangle \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \quad \textit{fst-pl} \end{array} \end{array} \right] \\ \text{COMPS} \quad \langle \text{NP}, [] \rangle \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \quad \textit{fst-pl} \end{array} \end{array} \right] \\ \text{COMPS} \quad \langle \text{NP}, \text{S} \rangle \end{array} \right] \end{array} \right]$$

$$24. \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \quad \textit{v} \\ \text{COMPS} \quad \langle \text{NP}, \text{S} \rangle \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \quad \textit{thd-sg} \end{array} \end{array} \right] \\ \text{COMPS} \quad \langle \text{NP} \rangle \end{array} \right] \end{array} \right] \text{ is unde-}$$

defined

$$25. \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \quad \textit{v} \\ \text{COMPS} \quad \langle \text{NP} \rangle \end{array} \right] \end{array} \right] \cup \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \quad \textit{thd-pl} \end{array} \end{array} \right] \\ \text{COMPS} \quad \langle \text{NP} \rangle \end{array} \right] \end{array} \right] = \left[\begin{array}{c} \textit{word} \\ \text{SYN} \left[\begin{array}{c} \textit{cat} \\ \text{POS} \left[\begin{array}{c} \textit{v} \\ \text{AGR} \quad \textit{thd-pl} \end{array} \end{array} \right] \\ \text{COMPS} \quad \langle \text{NP} \rangle \end{array} \right] \end{array} \right]$$