Syntactic Theory 09-10: First Revision and Exercises

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(Partially based on Valia Kordoni's revision questions)

- Dependency Grammars

  1. What is a dependency? Name its three formal properties

  2. Name two other (typical) properties of dependency representations

  3. Phrase Structure representations focus on how surface structure is built up by combining words and phrases. Such representations may capture facts about syntactic relations, because dependents tend to stand close to their head. Which principle referred to in Dependency Grammars captures this property of language?

  4. Provide a dependency analysis (meaning surface syntactic dependencies) that clearly distinguishes the two readings (reflected in the translation) of the following French sentence:

     (1) Chez moi Marie a   trouvé ce   vin dégueulasse.
          With me Marie has found this wine disgusting

          "At my place, Mary found this disgusting wine"
          "At my place, Mary found this wine disgusting"

     Consider the second reading of the sentence (Mary found this wine disgusting): just like in the first reading "disgusting" says something about "wine". At first sight, it may seem that "wine" is governed by both "disgusting" and "found".
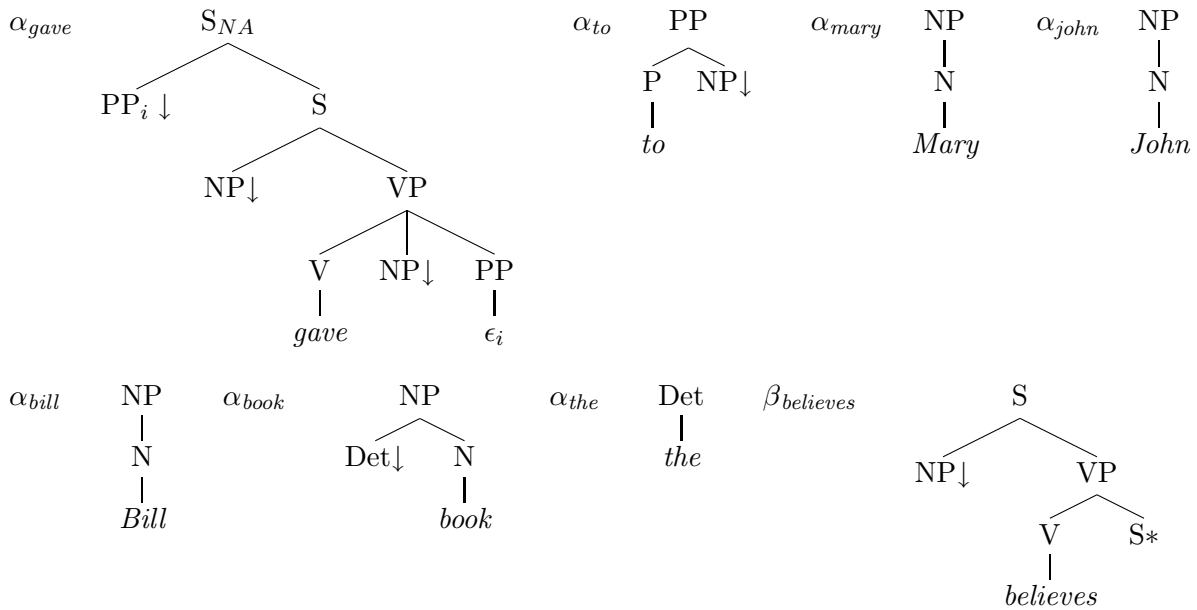
     – What answers do Mel'čuk and Hudson respectively provide to this observation? Restrict your answer to one sentence for each solution to this (apparent) violation of "unique headedness".

  5. Briefly explain how arguments (or actants) can be distinguished from adjuncts (or modifiers) by comparing syntactic and semantic dependencies in Meaning Text Theory.
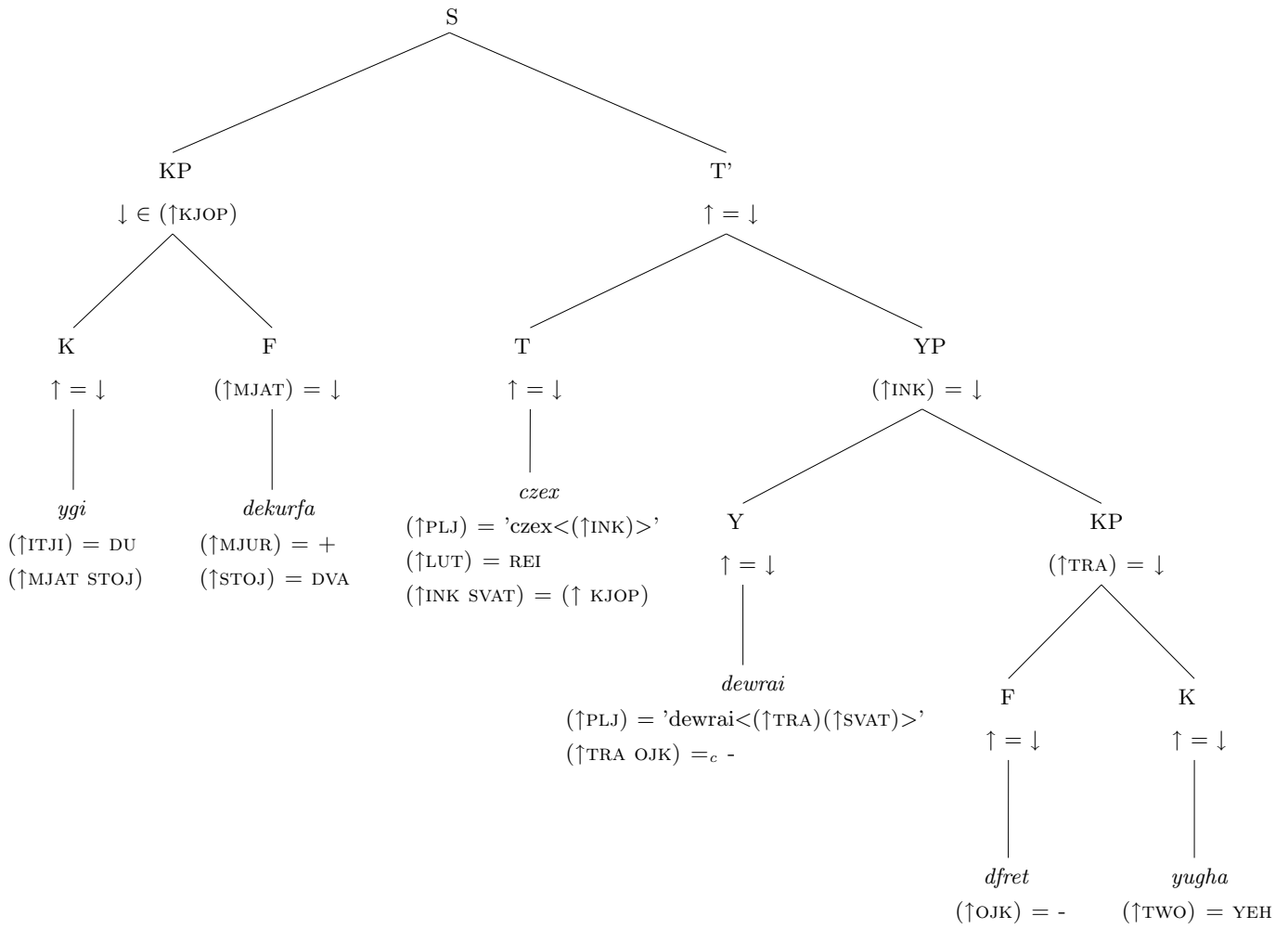
- TAG

  1. What do EDL and FRD stand for? Briefly explain how they are achieved in the TAG formalism.

  2. How is TAG different from TSG from a formal point of view?

  3. Propose a TAG that generates exactly the language $\{wew | w \in \{a, b\}^*\}$ (i.e., the so-called copy language, where each sentence is composed of a e in the middle, surrounded by two identical sub-sequences with any number of a's and b's in arbitrary order).

  4. With the given LTAG, draw the the derived tree and derivation tree for the given sentence:

(2) To Mary Bill believes John gave the book.

α_{gave}

```
              S_NA
             /    \
        PP_i ↓     S
                  /  \
               NP↓    VP
                     / | \
                    V  NP↓ PP
                    |      |
                  gave    ε_i
```

α_{to}

```
       PP
      /  \
     P    NP↓
     |
     to
```

α_{mary}

```
   NP
   |
   N
   |
  Mary
```

α_{john}

```
   NP
   |
   N
   |
  John
```

α_{bill}

```
   NP
   |
   N
   |
  Bill
```

α_{book}

```
      NP
     /  \
  Det↓   N
         |
        book
```

α_{the}

```
   Det
   |
   the
```

$\beta_{believes}$

```
        S
       / \
     NP↓  VP
         /  \
        V    S*
        |
     believes
```

- LFG

  1. Name the (formally) different representations that LFG uses in order to encode linguistically different kinds of information. Explain briefly what kind of information is represented in each of these different levels of representation.

  2. What is the motivation of introducing f-structures? Name two reasons.

  3. What is a c-structure and how is it assigned?

  4. What is an f-structure and how is the formal description of an appropriate f-structure derived?

  5. Which three principles must be respected in a well-formed f-structure? Briefly explain how they restrict the f-structure.

  6. How are c-structures related to f-structures in LFG?

  7. What does ↑ = ↓ mean?

  8. What do the symbols ↑ and ↓ stand for?

  9. How can grammatical constraints be integrated in LFG grammars? Name at least three types of constraints and explain in one sentence each what their function is.

  10. What does ↑ stand for in 'smile<(↑SUBJ)>'?

  11. The c-structure below is part of a theory that uses the same formalism and similar well-formedness constraints as LFG. Derive the f-structure of the expression:

S
├── KP   ↓ ∈ (↑KJOP)
│   ├── K   ↑ = ↓
│   │   └── *ygi*
│   │   (↑ITJI) = DU
│   │   (↑MJAT STOJ)
│   └── F   (↑MJAT) = ↓
│   └── *dekurfa*
│   (↑MJUR) = +
│   (↑STOJ) = DVA
└── T'   ↑ = ↓
    ├── T   ↑ = ↓
    │   └── *czex*
    │   (↑PLJ) = 'czex<(↑INK)>'
    │   (↑LUT) = REI
    │   (↑INK SVAT) = (↑ KJOP)
    └── YP   (↑INK) = ↓
        ├── Y   ↑ = ↓
        │   └── *dewrai*
        │   (↑PLJ) = 'dewrai<(↑TRA)(↑SVAT)>'
        │   (↑TRA OJK) =_c -
        └── KP   (↑TRA) = ↓
            ├── F   ↑ = ↓
            │   └── *dfret*
            │   (↑OJK) = -
            └── K   ↑ = ↓
                └── *yugha*
                    (↑TWO) = YEH

12. Provide an LFG-analysis for the following sentence:

    (i) Peter sent flowers to the pretty girl

- HPSG

    1. With the given type hierachy (already a BCPO), work out the AVM unification results:

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$$\top$$

$$t_1 \qquad t_2 \qquad t_3$$

$$t_4 \qquad t_5 \qquad t_6$$

$$t_7$$
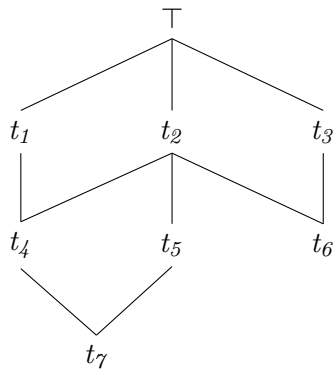
(a)
$$t_1\begin{bmatrix} F_1 & \boxed{1} \\ F_2 \mid F_3 & \boxed{1} \end{bmatrix} \sqcup \; t_5\begin{bmatrix} F_1 \mid F_2 & \boxed{1} \\ F_3 & \boxed{1} \end{bmatrix}$$

(b)
$$t_1\begin{bmatrix} F_1 & \boxed{1}\, t_5 \\ F_2 & \boxed{1} \end{bmatrix} \sqcup \; t_4\begin{bmatrix} F_2 & \boxed{1}\, t_2 \\ F_3 & \boxed{1} \end{bmatrix} \sqcup \; t_5\begin{bmatrix} F_3 & t_3 \end{bmatrix}$$

2. Name at least three main characteristics of HPSG with brief descriptions of what they mean

3. What do ID schemata and LP rule determine in HPSG?

4. What is the relation between typed feature structures, AVMs and linguistic objects in HPSG?

5. What does it mean for a typed feature structure to be *totally well-typed* and *sort-resolved*?

6. For which type is the feature *case* defined? And what is the feature path leading to it in an HPSG *sign*?

7. In HPSG, is the syntactic head always the same as the semantic head in a headed phrase? If not, please specify when they will be different. And how is this difference described in the HPSG theory?

Good luck with your revision!

Have a great Christmas break and a Happy New Year!