Parsing with HPSG Exercises

Task 1: due on October 18th 2011
Deadline: November 15th 2011, 11:50 a.m

A. Unification

1. Calculate the unifications. If the unification is impossible, write *fail to unify*.

$$\begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{FIRST} & \textit{fred} \end{bmatrix} \\ \text{PET} & \begin{bmatrix} \text{KIND} & \textit{dog} \\ \text{NAME} & \textit{fido} \end{bmatrix} \end{bmatrix} \cup \begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{LAST} & \textit{smith} \end{bmatrix} \\ \text{PET} & \begin{bmatrix} \text{KIND} & \textit{dog} \\ \text{AGE} & 3 \end{bmatrix} \end{bmatrix} =$$

$$\begin{bmatrix} \text{NAME} \mid \text{FIRST} & \textit{fred} \\ \text{DAD} & \begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{LAST} & \textit{jones} \end{bmatrix} \\ \text{PET} & \begin{bmatrix} \text{NAME} & \textit{fido} \end{bmatrix} \end{bmatrix} \end{bmatrix} \cup \begin{bmatrix} \text{NAME} \mid \text{LAST} & \textit{jones} \\ \text{DAD} & \begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{FIRST} & \textit{bill} \end{bmatrix} \\ \text{PET} & \begin{bmatrix} \text{KIND} & \textit{dog} \end{bmatrix} \end{bmatrix} \end{bmatrix} =$$

$$\begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{FIRST} & \textit{fred} \end{bmatrix} \\ \text{DAD} & \begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{LAST} & \textit{jones} \end{bmatrix} \\ \text{PET} & \begin{bmatrix} \text{NAME} & \textit{fido} \end{bmatrix} \end{bmatrix} \end{bmatrix} \cup \begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{LAST} & \textit{smith} \end{bmatrix} \\ \text{DAD} & \begin{bmatrix} \text{NAME} & \begin{bmatrix} \text{FIRST} & \textit{bill} \end{bmatrix} \\ \text{PET} & \begin{bmatrix} \text{NAME} & \textit{rover} \end{bmatrix} \end{bmatrix} \end{bmatrix} =$$

$$\begin{bmatrix} \text{BRO} & \begin{bmatrix} \text{SEX} & \textit{male} \end{bmatrix} \\ \text{SIS} & \begin{bmatrix} \text{SEX} & \textit{female} \end{bmatrix} \end{bmatrix} \cup \begin{bmatrix} \text{NAME} & \textit{fred} \\ \text{BRO} & \begin{bmatrix} \text{NAME} & \textit{al} \end{bmatrix} \\ \text{SIS} & \begin{bmatrix} \text{NAME} & \textit{sal} \end{bmatrix} \end{bmatrix} =$$

2. Calculate the unifications and compare *a* and *b*.

a.

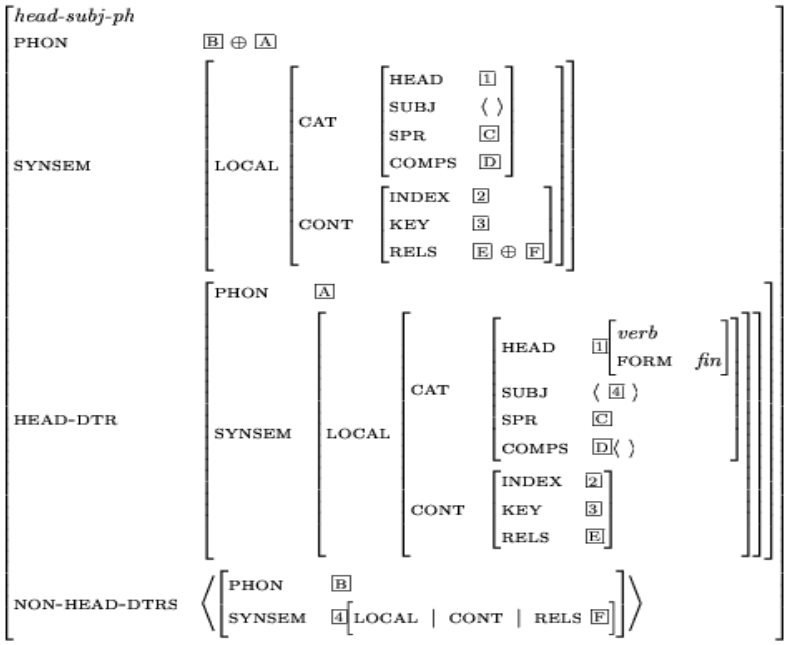
$$\begin{pmatrix} \text{A} & [\text{B} & \text{a}] \\ \text{C} & [\text{D} & [\text{B} & \text{a}]] \end{pmatrix} \quad \& [\text{C} \quad [\text{D} \quad [\text{E} \quad \text{b}]]] =$$

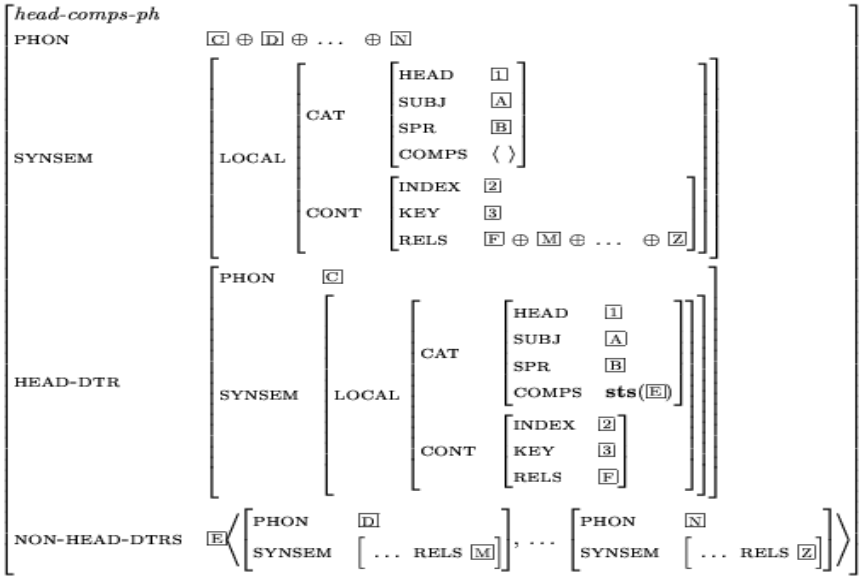
b.

$$\begin{pmatrix} \text{A} & \mathbb{1}[\text{B} & \text{a}] \\ \text{C} & [\text{D} & \mathbb{1}] \end{pmatrix} \quad \& [\text{C} \quad [\text{D} \quad [\text{E} \quad \text{b}]]] =$$

B. ID Schemata

1. Using the *head-subject* schema and the *head-complement* schema,





give the HPSG analysis of the given English sentence:

John reads a book.

Main points: a. give the lexical entries for the verb and the nouns;
b. unify these entries by applying the head-subject/complement schema;
c. comment the interacted principles such as HFP, ValP.