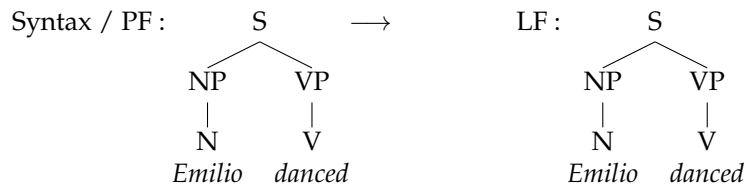# F08: Composition exercise

Course in Semantics · Ling 531 / 731
McKenzie · University of Kansas

Key

1   How-to

1. **Step 1: Build the LF.** The syntax feeds the semantics, so if you don't know what the syntactic structure is, you can't really do the composition.[1]

   Syntax / PF :   S $\longrightarrow$ LF :   S

   ```
         S                              S
        / \                            / \
      NP   VP                        NP   VP
       |    |                         |    |
       N    V                         N    V
    Emilio danced                  Emilio danced
   ```

   So far, the two structures are identical. I'm just being thorough. All you will need to put is the LF.

2. **Step 2: Start at the bottom.** I usually start with the VP and its complements. The syntactic heads are inserted. Each has lexical information; for now we'll only care about the truth conditional part.

   For now, we'll ignore information like tense or agreement.

   (1)   ⟦ *Emilio* ⟧ = Emilio

   (2)   ⟦ *danced* ⟧ = f: D $\rightarrow$ {1,0}
                for all x $\in$ D, f(x) = 1 if and only if **x danced**

   Note that I used D again for our domain. We could've picked any set; let's say that D is the set of all individuals.

3. **Step 3: Terminal Nodes**

   ```
        ...              ->              ...
       /   \                           /   \
     ...   ...                       ...    ...
      |     |                         |      |
   ⟦Emilio⟧ ⟦danced⟧          TN : Emilio  TN : f: D → {1,0}
   ```

   TN : Emilio   **TN :** f: D $\rightarrow$ {1,0}
                for all x $\in$ D, f(x) = 1 if and only if **x danced**
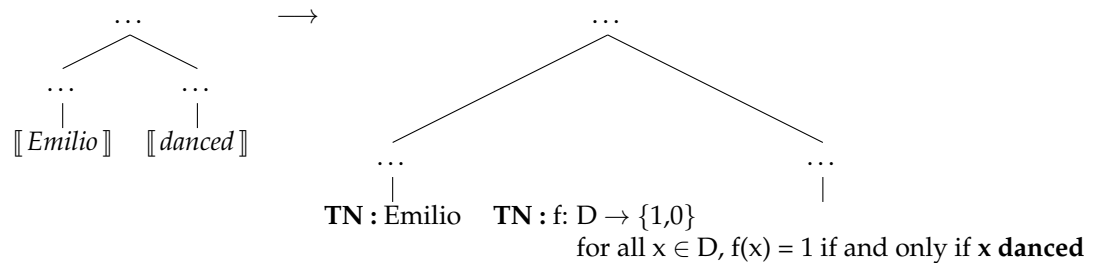
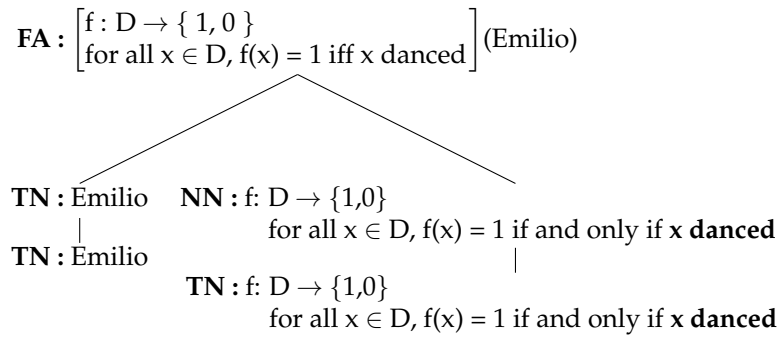
[1] Later you'll be able to reverse engineer the composition and demonstrate what the syntactic structure must be.

4. **Step 4: Compose!**

   Keep it up til the top. We build up with NN. **The nodes that you've built do not ever change.** There is no movement in the semantics, since movement is a purely syntactic process.

   $\cdots$

   TN : Emilio   **NN :** f: D $\rightarrow$ {1,0}
   | for all x $\in$ D, f(x) = 1 if and only if **x danced**
   TN : Emilio |
                  TN : f: D $\rightarrow$ {1,0}
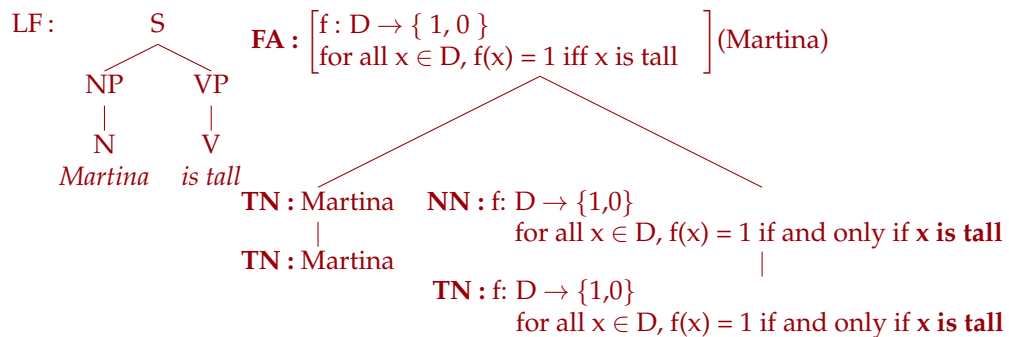   for all x $\in$ D, f(x) = 1 if and only if **x danced**
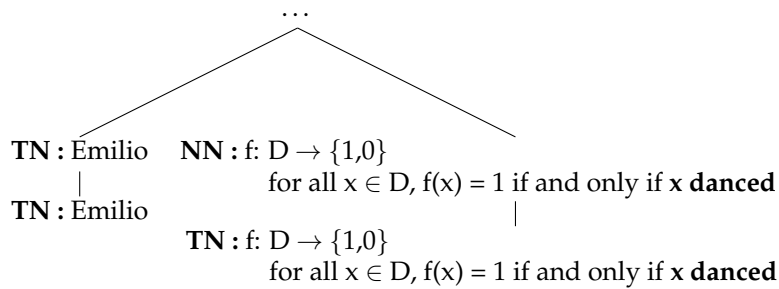
   Now we have a function, and a saturated expression denoting an individual, which puts it in the domain of the function. We can thus use FA; no other rule would even suffice.

   $$\textbf{FA :} \begin{bmatrix} f : D \rightarrow \{\,1,0\,\} \\ \text{for all } x \in D, f(x) = 1 \text{ iff } x \text{ danced} \end{bmatrix} (\text{Emilio})$$

   TN : Emilio   **NN :** f: D $\rightarrow$ {1,0}
   | for all x $\in$ D, f(x) = 1 if and only if **x danced**
   TN : Emilio |
                  TN : f: D $\rightarrow$ {1,0}
                         for all x $\in$ D, f(x) = 1 if and only if **x danced**

2   Now you try!

1. *Martina is tall.* [treat *is tall* is one word, *tall*]

LF :   S $$\textbf{FA :} \begin{bmatrix} f : D \rightarrow \{\,1,0\,\} \\ \text{for all } x \in D, f(x) = 1 \text{ iff } x \text{ is tall} \end{bmatrix} (\text{Martina})$$

   NP   VP
   | |
   N   V
Martina *is tall*
                  TN : Martina   **NN :** f: D $\rightarrow$ {1,0}
                  | for all x $\in$ D, f(x) = 1 if and only if **x is tall**
                  TN : Martina |
                               TN : f: D $\rightarrow$ {1,0}
                                    for all x $\in$ D, f(x) = 1 if and only if **x is tall**

2. *Eleanor runs.*

LF:

```
        S
      /   \
    NP     VP
    |      |
    N      V
 Eleanor  runs
```

FA : $\begin{bmatrix} f : D \to \{\,1, 0\,\} \\ \text{for all } x \in D, \ f(x) = 1 \text{ iff } x \text{ runs} \end{bmatrix}$ (Eleanor)

TN : Eleanor   **NN :** f: D → {1,0}
| for all x ∈ D, f(x) = 1 if and only if **x runs**
TN : Eleanor |
         TN : f: D → {1,0}
                  for all x ∈ D, f(x) = 1 if and only if **x runs**
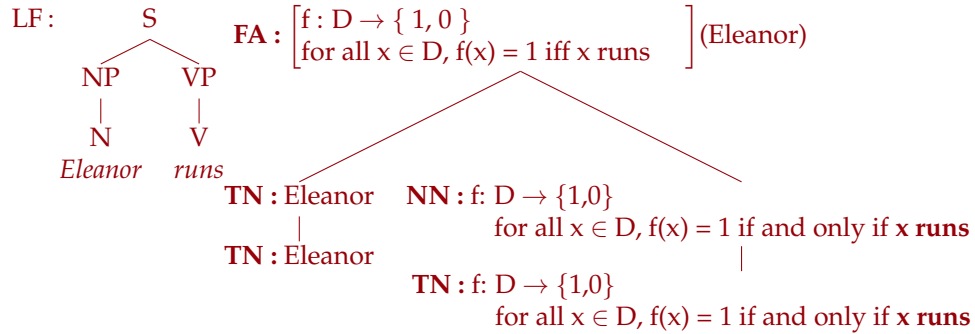
3. *Porter is eating.* [treat *is eating* is one word, in the syntax *[is eating]*]

LF:

```
        S
      /   \
    NP     VP
    |      |
    N      V
  Porter  is eating
```

FA : $\begin{bmatrix} f : D \to \{\,1, 0\,\} \\ \text{for all } x \in D, \ f(x) = 1 \text{ iff } x \text{ is eating} \end{bmatrix}$ (Porter)

TN : Porter   **NN :** f: D → {1,0}
| for all x ∈ D, f(x) = 1 if and only if **x is eating**
TN : Porter |
         TN : f: D → {1,0}
                  for all x ∈ D, f(x) = 1 if and only if **x is eating**

4. *Socrates pondered.*

LF:

```
        S
      /   \
    NP     VP
    |      |
    N      V
 Socrates pondered
```

FA : $\begin{bmatrix} f : D \to \{\,1, 0\,\} \\ \text{for all } x \in D, \ f(x) = 1 \text{ iff } x \text{ pondered} \end{bmatrix}$ (Socrates)

TN : Socrates   **NN :** f: D → {1,0}
| for all x ∈ D, f(x) = 1 if and only if **x pondered**
TN : Socrates |
         TN : f: D → {1,0}
                  for all x ∈ D, f(x) = 1 if and only if **x pondered**