Telecom ParisTech

Introduction to semantics
SD213

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Sentence > **John dreams of Mary**

The sentence is syntactically correct
[gloss:dream,num:sing,pers:3,subj:dp([gloss:john,num:sing]),cpl:[pp(of)]]

```
s
 |__dp
 | |__pn : john
 |__vp
   |__v : dream
   |__pp
     |__p : of
     |__dp
       |__pn : mary
```

--> **dream(john, mary)**
this sentence makes sense

```
vp(FV, PVP, TVP) --> v(FV, PV, TV), dp(FDP, PDP, TDP),
   { % transitive verb, eg. like
     att(FV, cpl, [dp(FDP)]),
     link(_, PV, PDP, PVP),
     TVP = vp(TV, TDP) }.
```

FV: Feature structure (here for verb phrase) – used to check various forms of agreement.
PVP: Predicate (here, predicate for verb phrase) which will be the output of the interpretation.
TVP: Tree structure for display (here for verb phrase)

FS of *believe*: [gloss:believe, num:sing, pers:3, subj:dp(_), cpl:[cp(that)]].

`att` gets the value of a feature (here `cpl` = complement) in the feature structure.
`link` is used to perform semantic link between syntactically connected phrases.

`link(2, daughter(X,Y), child(Z))` will impose `Y = Z`.

Sentence > **the boy dreams of the nice girl**

The sentence is syntactically correct
[gloss:dream,num:sing,pers:3,subj:dp([gloss:boy,num:sing]),cpl:[pp(of)]]

```
s
    |__dp
    | |__det : the
    | |__np
    |    |__n : boy
    |__vp
      |__v : dream
      |__pp
        |__p : of
        |__dp
          |__det : the
          |__np
            |__adj : nice
            |__np
              |__n : girl
```

Procedural semantics
- is synchronized with syntax,
- builds a predicate each time a phrase is recognized (eg. *girl* → girl(X); *nice* → nice(Y)),
- performs semantic linking (here: X = Y),
- triggers semantic interpretation by executing the last recognized predicate (eg. girl(X) → X=mary; X=ann, nice(X) → X=mary.

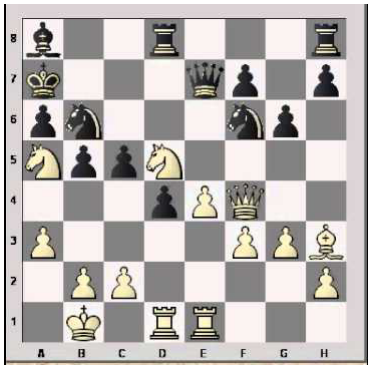
--> **dream(john,ann)** [boy(john),nice(ann),girl(ann)]
this sentence makes sense

the child talks with the nice girl about the room

may be interpreted as:

```
talk(John, Ann, my_room)
talk(Pat, Ann, my_room)
```


Procedural semantics



```
Phrase > the white knight
...> knight(white,(1,5))
...> knight(white,(4,5))

Sentence > the white knight is white
true.

Sentence > the black knight is white
false.
```

```
Phrase > to the right of the white knight
...> right((2,5),(1,5))
...> right((5,5),(4,5))

Phrase > the pawn to the right of the white knight
...> pawn(black,(2,5))
```