Chapter 5, sections 5.1-5.5:

Semantics

Where's meaning?

So far, our grammar has no semantic representations. We have, however, been relying on semantic intuitions in our argumentation, and discussing semantic contrasts where they line up (or don't) with syntactic ones.

Examples?

- structural ambiguity
- count/mass distinction
- complements vs. modifiers
- others?

Aspects of Meaning We Won't Account for

- Pragmatics -- meaning conveyed but not expressed directly
- Fine-grained lexical semantics -- things like the relationship between *kill* and *die*
- For us, the meaning of *life* is just:

$$\begin{bmatrix} \text{RELN} & \text{life} \\ \text{INST} & i \end{bmatrix}$$

A Sample Semantic Representation

$$\begin{bmatrix} \text{MODE} & \text{prop} \\ \text{INDEX} & s \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \text{save} \\ \text{SIT} & s \\ \text{SAVER} & i \\ \text{SAVED} & j \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Chris} \\ \text{NAMED} & i \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Pat} \\ \text{NAMED} & j \end{bmatrix} \right\rangle \end{bmatrix}$$

"... the linguistic meaning of *Chris saved Pat* is a proposition that will be true just in case there is an actual situation that involves the saving of someone named Pat by someone named Chris." (p. 140)

Aspects of Meaning We Will Account for

What we are accounting for is the compositionality of sentence meaning.

- How the pieces fit together

  ➞ Semantic arguments and indices

- How the meanings of the parts add up to the meaning of the whole.

  ➞ Rules about how RESTR lists of a mother node relate to those of the daughters

Semantics in Our Grammar

- Kinds of meanings: generalization of truth conditions
  - proposition: what must be the case for a proposition to be true
  - directive: what must happen for a directive to be fulfilled
  - question: the kind of situation the asker is asking about
  - reference: the kind of entity the speaker is referring to

- Syntax/semantics interface: Constraints on how syntactic arguments are related to semantic ones, and on how semantic information is compiled from different parts of the sentence.

Feature Geometry

$$\begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & pos \\ \text{VAL} & \begin{bmatrix} \text{SPR} & list(expression) \\ \text{COMPS} & list(expression) \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \{ \text{prop} , \text{ques} , \text{dir} , \text{ref}, \text{none} \} \\ \text{INDEX} & \{ i , j , k , \ldots s_1 , s_2 , \ldots \} \\ \text{RESTR} & list(pred) \end{bmatrix} \end{bmatrix}$$

How the Pieces Fit Together

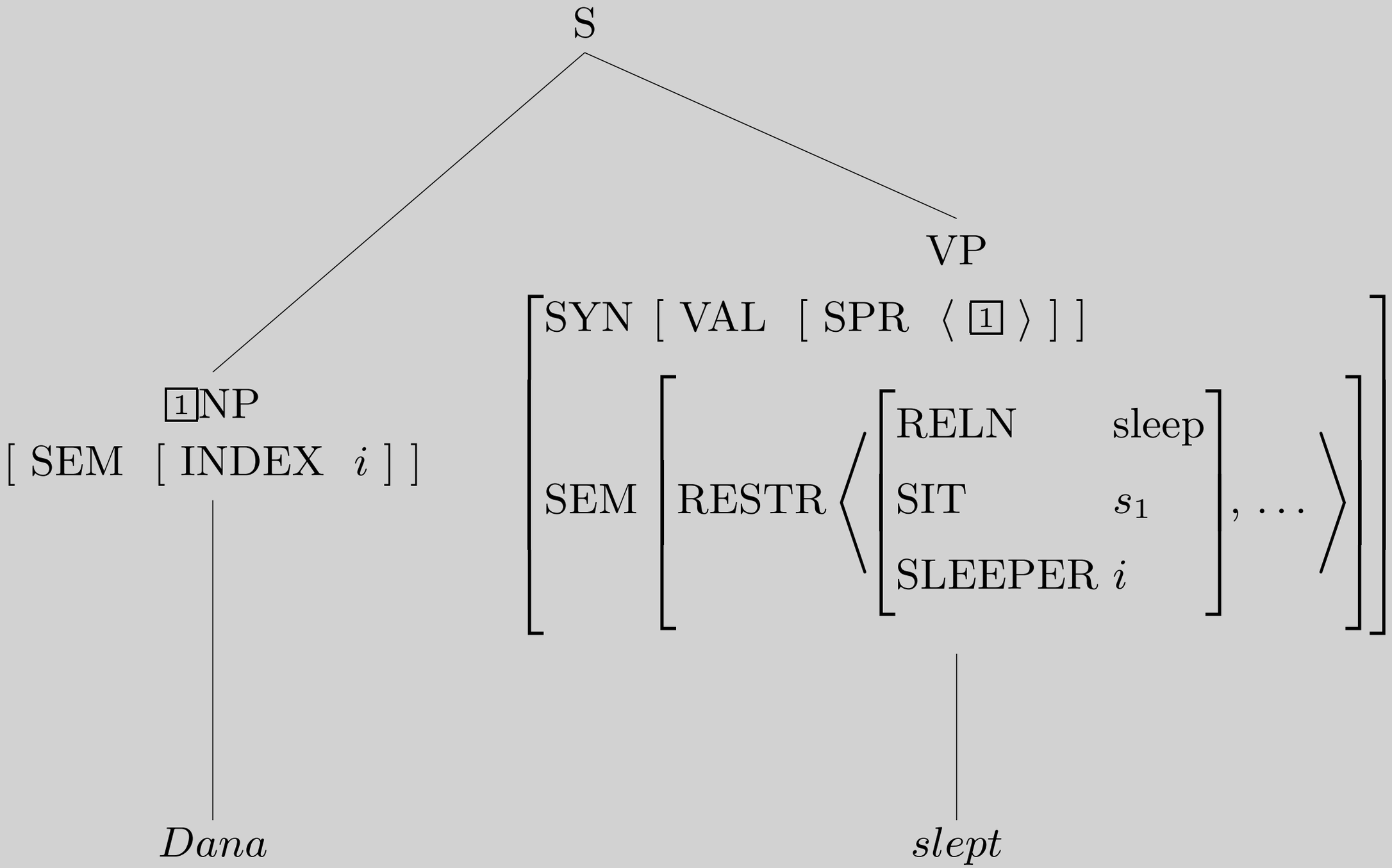
$$\left\langle \text{Dana} , \left[\begin{array}{ll} \textit{word} & \\ \text{SYN} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \textit{noun} & \\ \text{AGR} & \textit{3sing} \end{array} \right] \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \langle\ \rangle \\ \text{COMPS} & \langle\ \rangle \end{array} \right] \end{array} \right] \\ \text{SEM} & \left[\begin{array}{ll} \text{INDEX} & i \\ \text{MODE} & \text{ref} \\ \text{RESTR} & \left\langle \left[\begin{array}{ll} \text{RELN} & \text{name} \\ \text{NAME} & \text{Dana} \\ \text{NAMED} & i \end{array} \right] \right\rangle \end{array} \right] \end{array} \right] \right\rangle$$

How the Pieces Fit Together

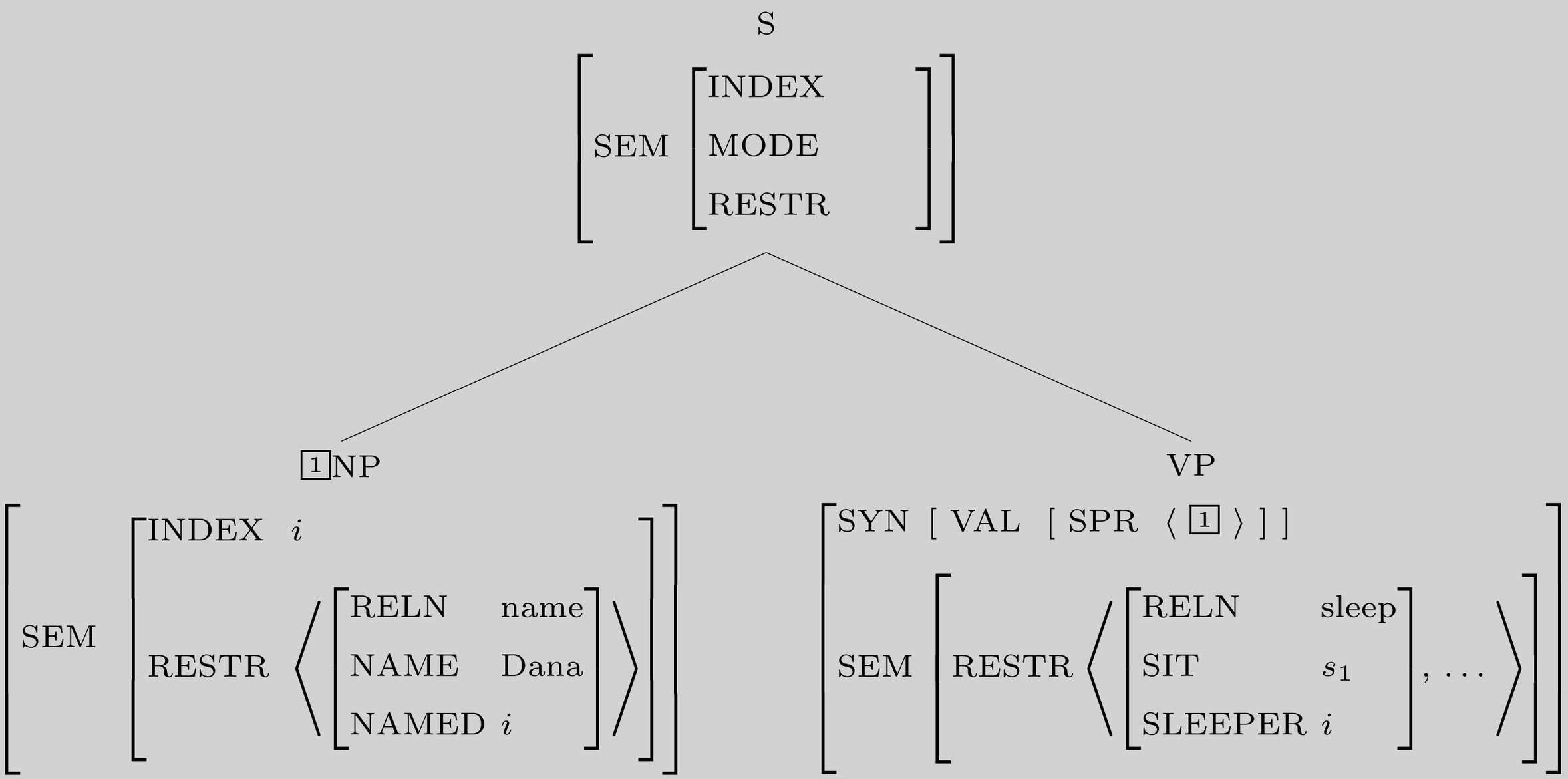
$$\left\langle \text{slept}, \left[\begin{array}{l} \textit{word} \\ \text{SYN} \left[\begin{array}{ll} \text{HEAD} & \textit{verb} \\ \text{VAL} & \left[\begin{array}{ll} \text{SPR} & \left\langle \left[\begin{array}{ll} \text{AGR} & \boxed{9} \\ \text{CASE} & \text{nom} \end{array}\right] \right\rangle \\ \text{COMPS} & \langle\,\rangle \end{array}\right] \end{array}\right] \\ \text{SEM} \left[\begin{array}{ll} \text{INDEX} & s_1 \\ \text{MODE} & \text{prop} \\ \text{RESTR} & \left\langle \left[\begin{array}{ll} \text{RELN} & \text{sleep} \\ \text{SIT} & s_1 \\ \text{SLEEPER} & j \end{array}\right], \ldots \right\rangle \end{array}\right] \end{array}\right] \right\rangle$$

NP$_j$

The Pieces Together



A More Detailed View of the Same Tree



To Fill in Semantics for the S-node

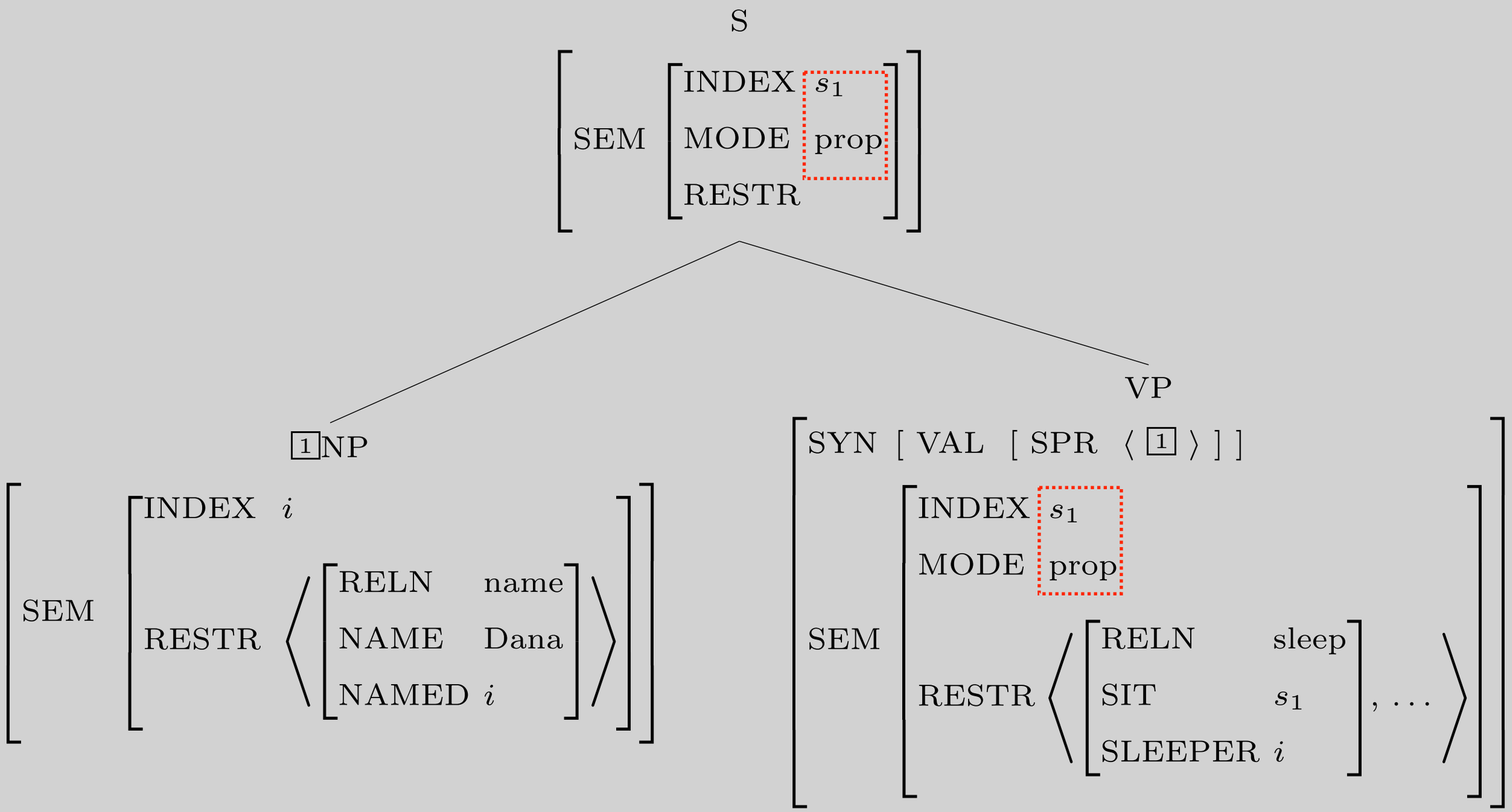
... we need some semantic principles

- The Semantic Inheritance Principle:

  In any headed phrase, the mother's MODE and INDEX are identical to those of the head daughter.

- The Semantic Compositionality Principle:

Semantic Inheritance Illustrated



To Fill in Semantics for the S-node

... we need some semantic principles

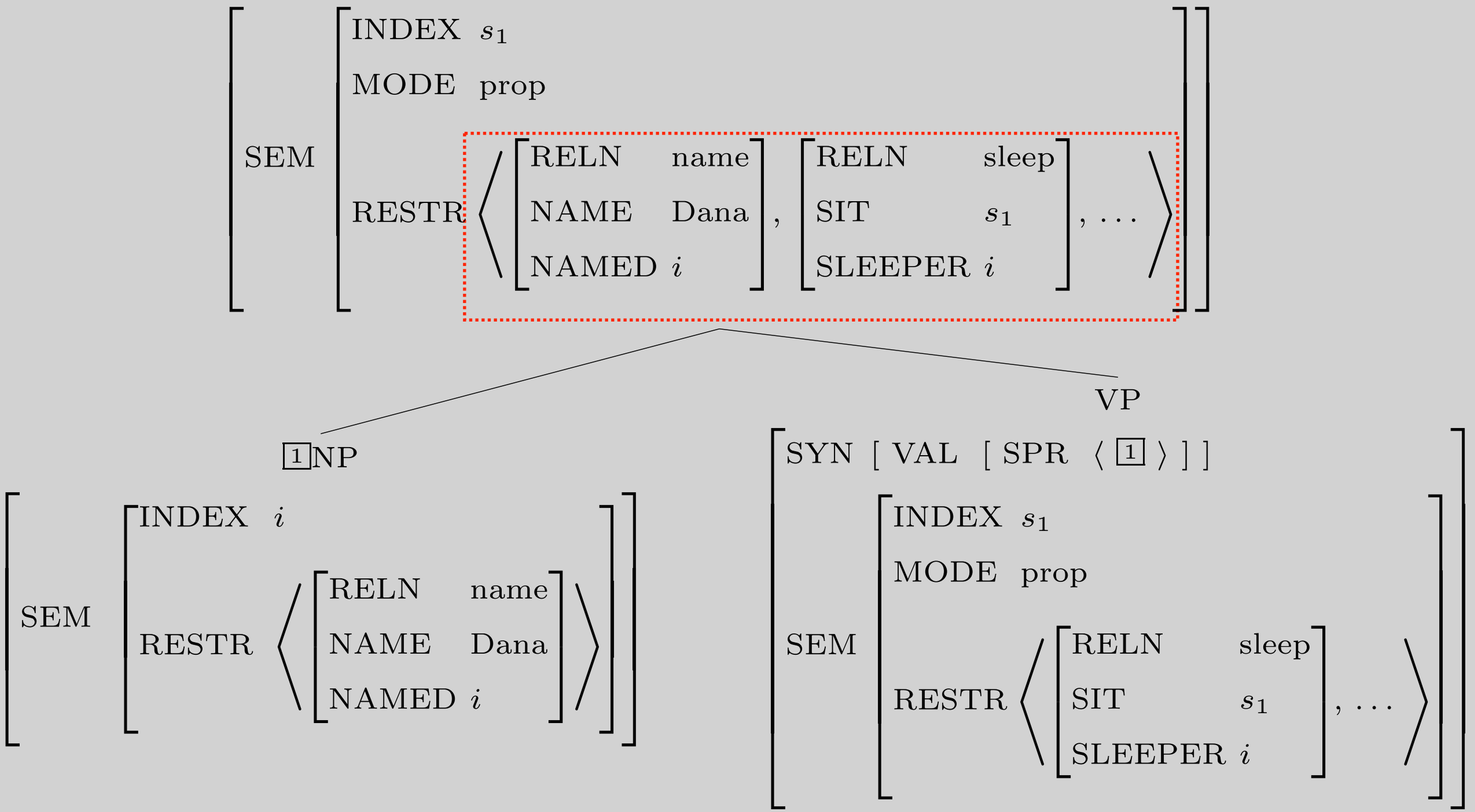
- The Semantic Inheritance Principle:

  In any headed phrase, the mother's MODE and INDEX are identical to those of the head daughter.

- The Semantic Compositionality Principle:

  In any well-formed (minimal) tree, the mother's RESTR value is the sum of the RESTR values of the daughters.

Semantic Compositionality Illustrated



What Identifies the indices?