Ling 566
Jan 23, 2019

Semantics

Overview

- Some notes on the linguist's stance
- Which aspects of semantics we'll tackle
- Our formalization; Semantics Principles
- Building semantics of phrases
- Modification, coordination
- Structural ambiguity
- Reading questions

The Linguist's Stance:
Building a precise model

- Some of our statements are statements about how the model works:

  "[*prep*] and [AGR *3sing*] can't be combined because AGR is not a feature of the type *prep*."

- Some of our statements are statements about how (we think) English or language in general works.

  "The determiners *a* and *many* only occur with count nouns, the determiner *much* only occurs with mass nouns, and the determiner *the* occurs with either."

- Some are statements about how we code a particular linguistic fact within the model.

  "All count nouns are [SPR < [COUNT +]>]."

The Linguist's Stance: A Vista on the Set of Possible English Sentences

- ... as a background against which linguistic elements (words, phrases) have a distribution
- ... as an arena in which linguistic elements "behave" in certain ways

Semantics: Where's the Beef?

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
- S/NP parallelism
- count/mass distinction
- complements vs. modifiers

Our Slice of a World of Meanings

Aspects of meaning we won't account for

- Pragmatics
- Fine-grained lexical semantics:

The meaning of *life* is *life'*, or, in our case,

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

Our Slice of a World of Meanings

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

"... 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)

Our Slice of a World of Meanings

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.

  Appending RESTR lists up the tree

Semantics in Constraint-Based Grammar

- Constraints as (generalized) 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

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

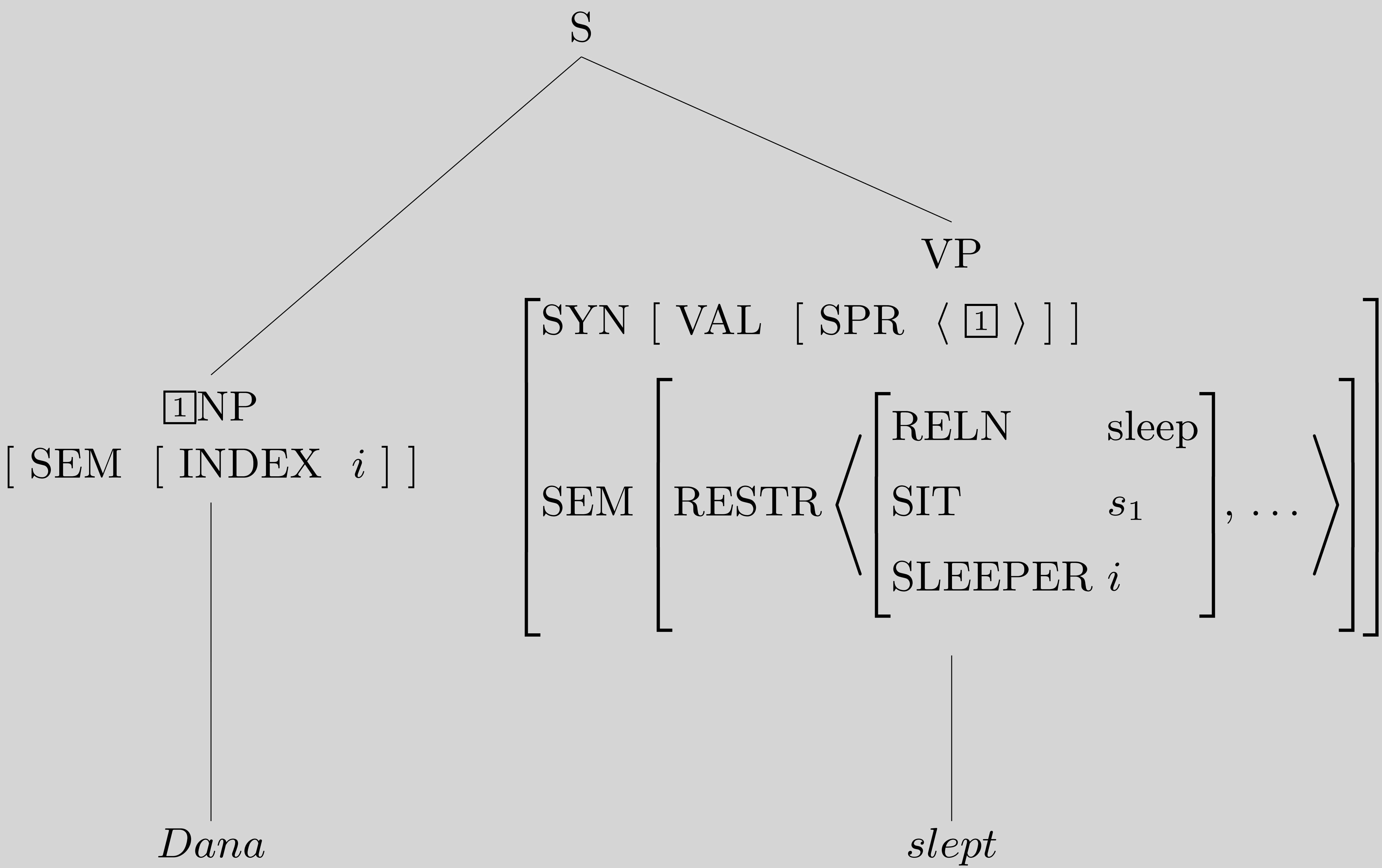
How the Pieces Fit Together

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

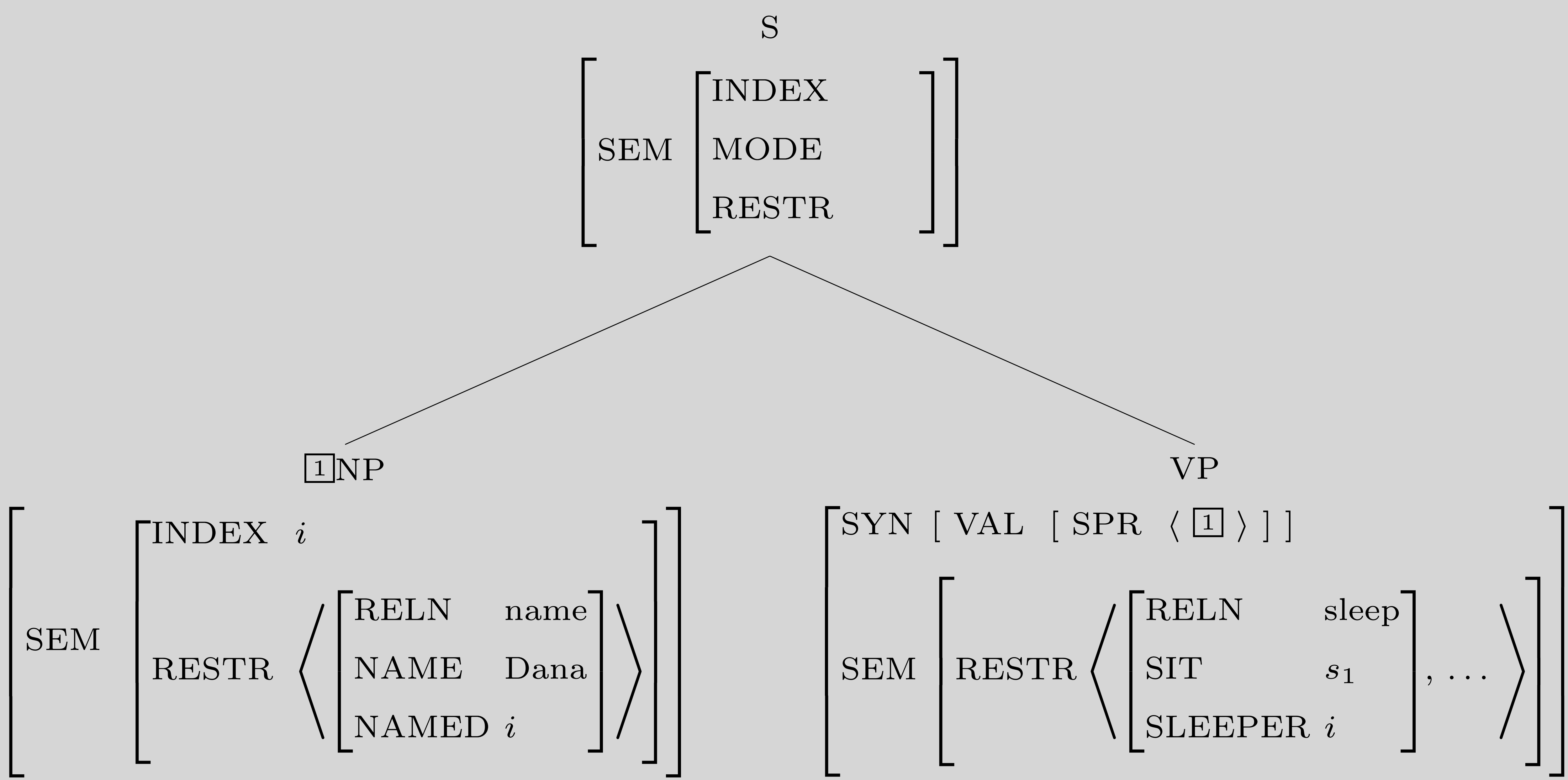
How the Pieces Fit Together

$$\left\langle \text{slept}, \begin{bmatrix} \textit{word} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{verb} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{NP}_{j} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \\ \text{MODE} & \text{prop} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \text{sleep} \\ \text{SIT} & s_1 \\ \text{SLEEPER} & j \end{bmatrix}, \ldots \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

The Pieces Together



A More Detailed View of the Same Tree



To Fill in Semantics for the S-node

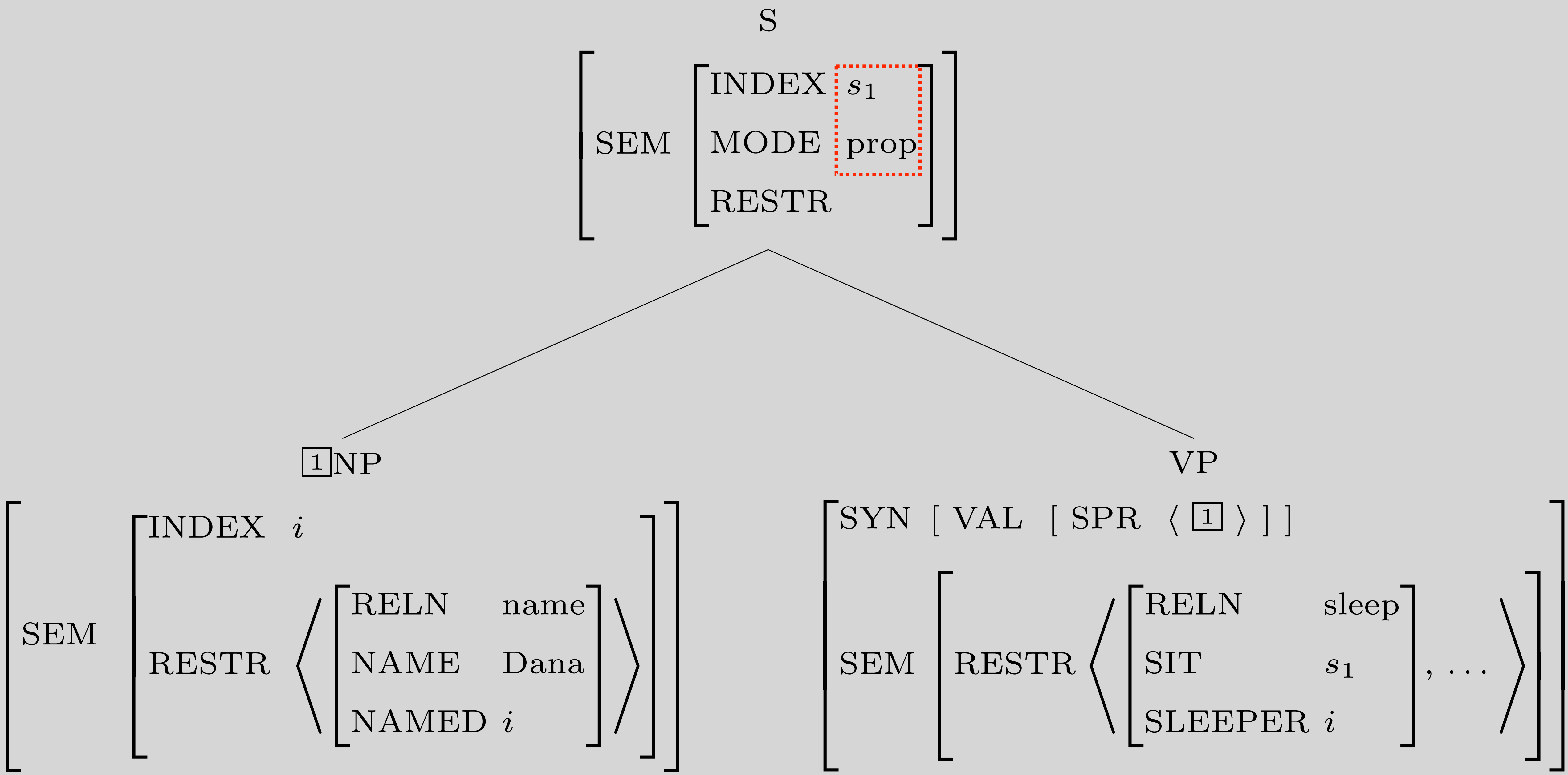
We need the Semantics Principles

- 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 the Semantics Principles

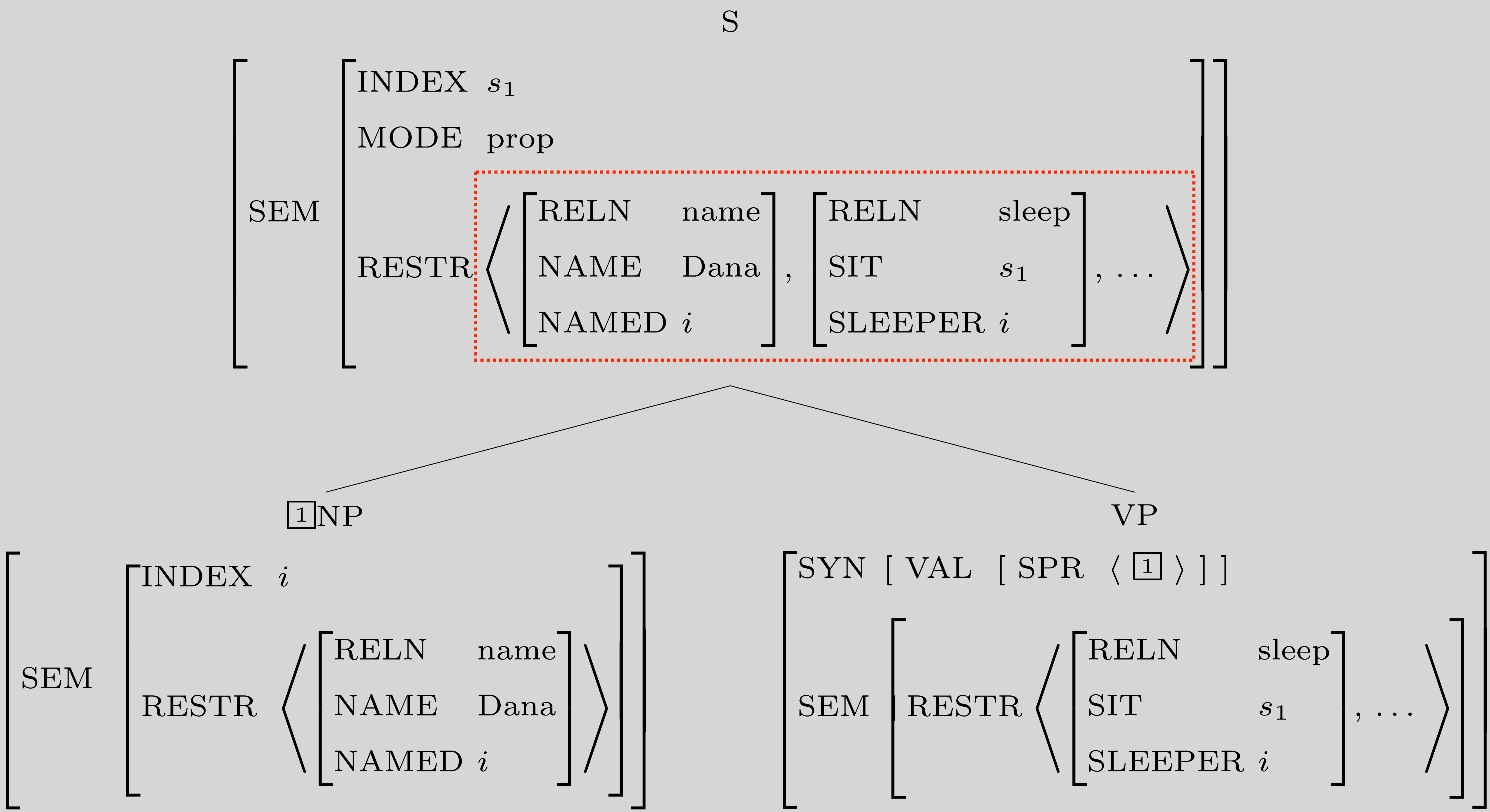
- The Semantic Inheritance Principle:

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

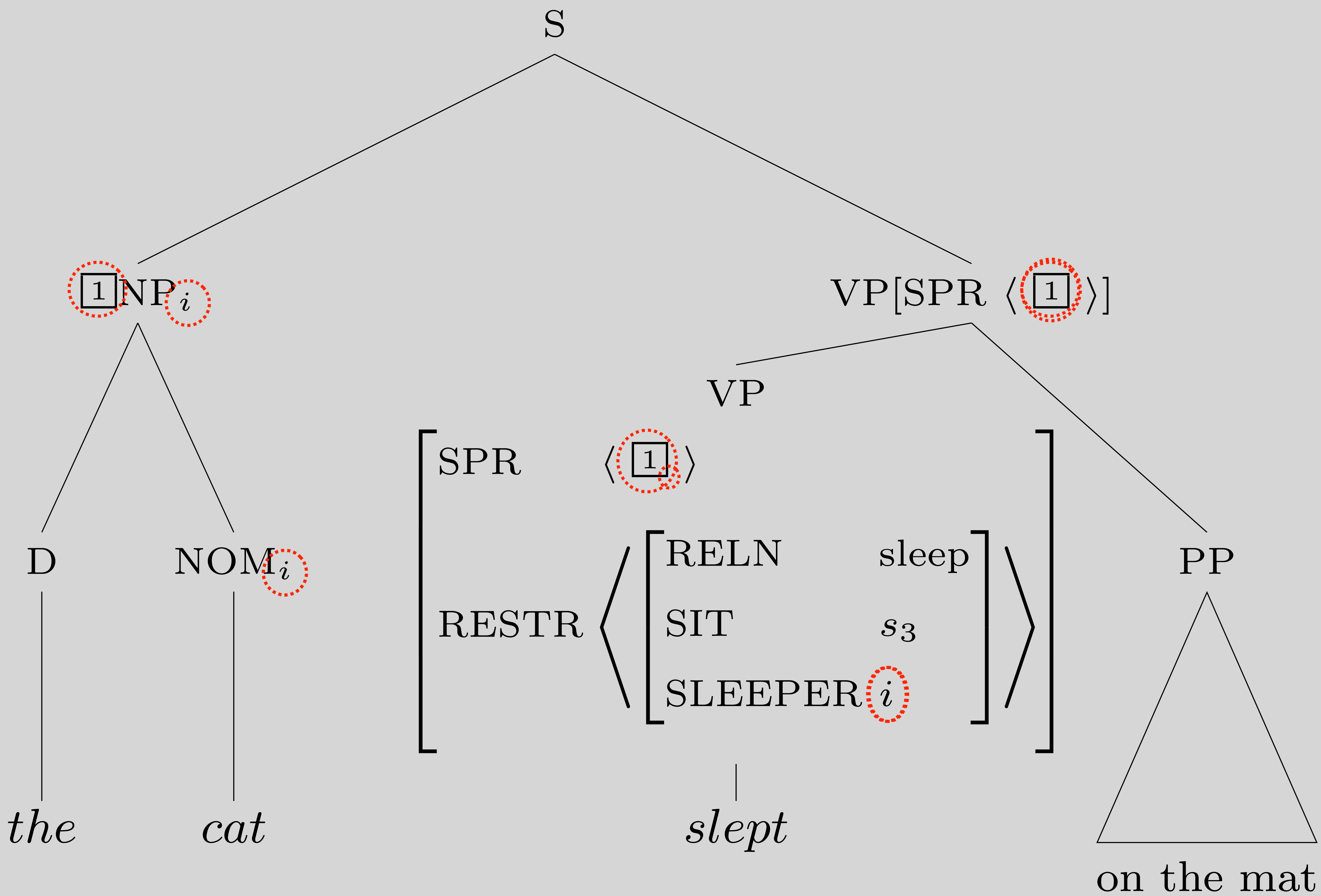
- The Semantic Compositionality Principle:

  In any well-formed phrase structure, the mother's RESTR value is the sum of the RESTR values of the daughter.

Semantic Compositionality Illustrated



What Identifies Indices?



Summary: Words ...

- contribute predications
- ‘expose’ one index in those predications, for use by words or phrases
- relate syntactic arguments to semantic arguments

$$\left\langle \text{slept}, \begin{bmatrix} \textit{word} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{verb} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{NP}_j \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \\ \text{MODE} & \text{prop} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \text{sleep} \\ \text{SIT} & s_1 \\ \text{SLEEPER} & j \end{bmatrix}, \ldots \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

Summary: Grammar Rules ...

- identify feature structures (including the INDEX value) across daughters

Head Specifier Rule

$$\begin{bmatrix} \textit{phrase} \\ \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \rightarrow \boxed{1} \quad \mathbf{H} \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{SPR} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Head Complement Rule

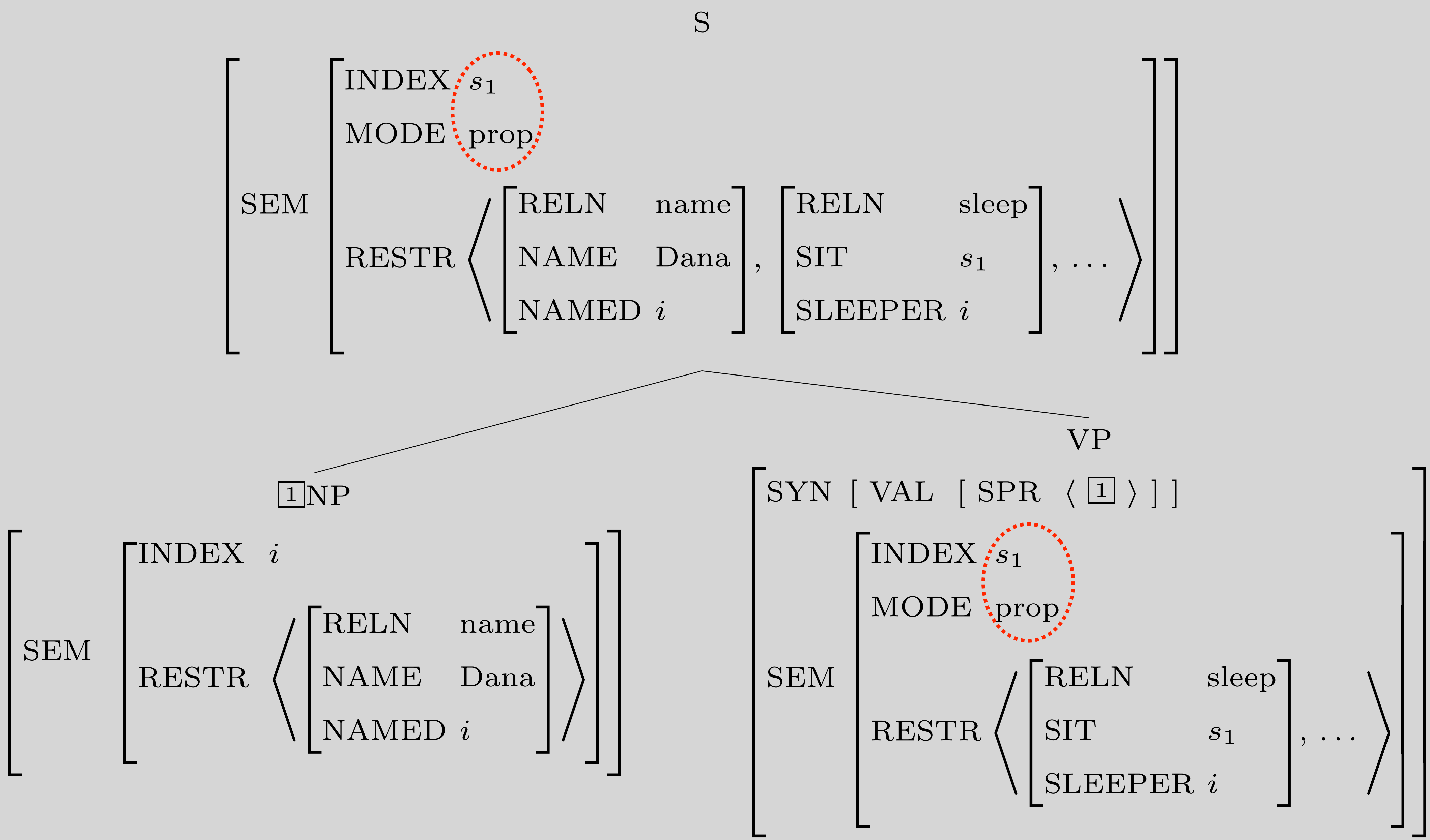
$$\begin{bmatrix} \textit{phrase} \\ \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \rightarrow \mathbf{H} \begin{bmatrix} \textit{word} \\ \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle \boxed{1}, \ldots, \boxed{n} \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \quad \boxed{1} \ldots \boxed{n}$$

Head Modifier Rule

$$[\textit{phrase}] \rightarrow \mathbf{H}\ \boxed{1} \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \\ \text{MOD} & \langle \boxed{1} \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

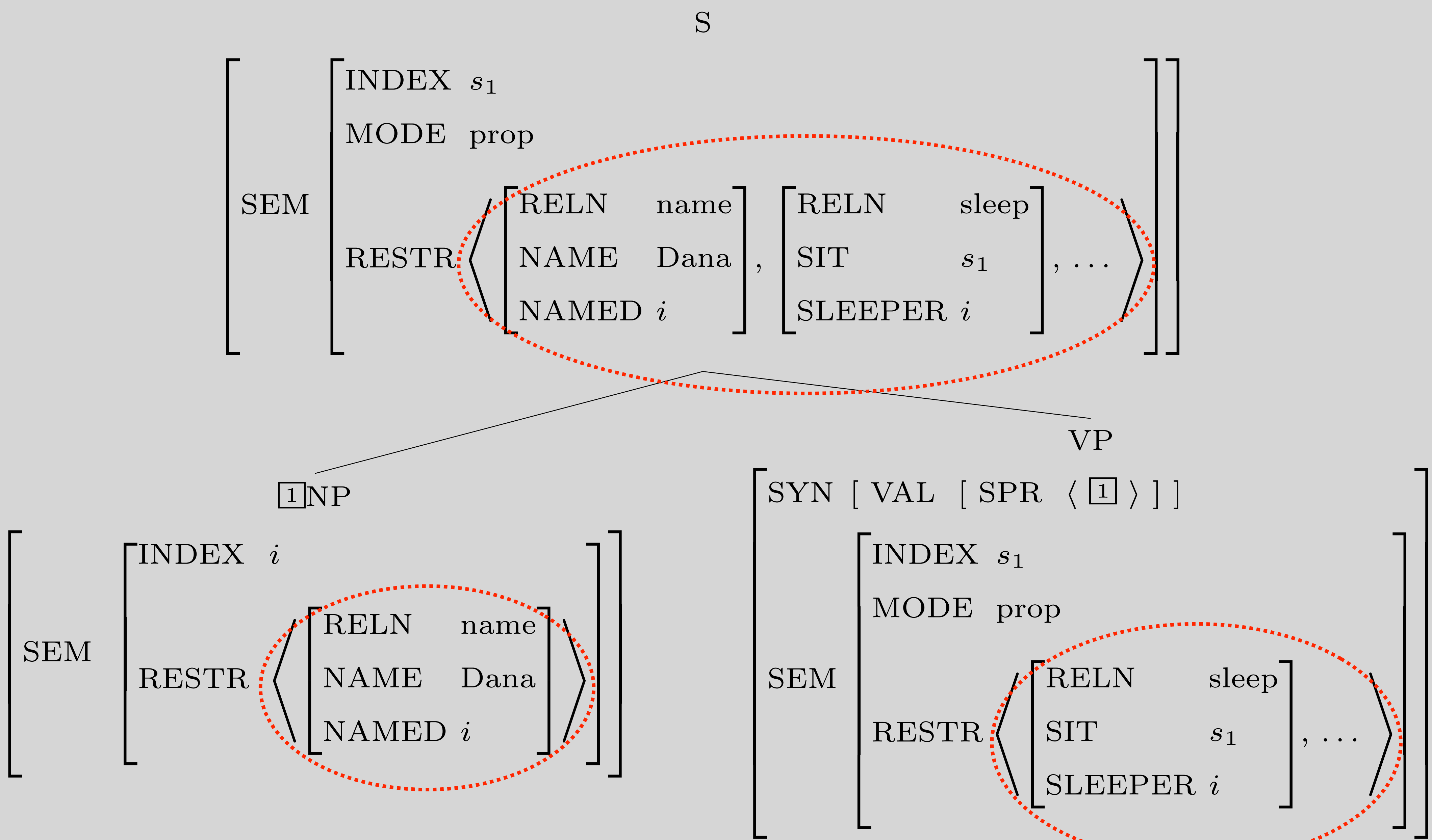
Summary: Grammar Rules ...

- identify feature structures (including the INDEX value) across daughters
- license trees which are subject to the semantic principles
  - SIP ‘passes up’ MODE and INDEX from head daughter



Summary: Grammar Rules ...

- identify feature structures (including the INDEX value) across daughters
- license trees which are subject to the semantic principles
  - SIP 'passes up' MODE and INDEX from head daughter
  - SCP: 'gathers up' predications (RESTR list) from all daughters



Other Aspects of Semantics

- Tense, Quantification (only touched on here)
- Modification
- Coordination
- Structural Ambiguity

Evolution of a Phrase Structure Rule

Ch. 2: NOM --> NOM PP

VP --> VP PP

Ch. 3: $$\begin{bmatrix} \textit{phrase} & \\ \text{VAL} & \begin{bmatrix} \text{COMPS} & \text{itr} \\ \text{SPR} & - \end{bmatrix} \end{bmatrix} \rightarrow \mathbf{H}\begin{bmatrix} \textit{phrase} & \\ \text{VAL} & \begin{bmatrix} \text{SPR} & - \end{bmatrix} \end{bmatrix} \text{PP}$$

Ch. 4: $$[\textit{phrase}] \rightarrow \mathbf{H}\begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \text{PP}$$

Ch. 5: $$[\textit{phrase}] \rightarrow \mathbf{H}\boxed{1}\begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{COMPS} & \langle\ \rangle \\ \text{MOD} & \langle \boxed{1} \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Ch. 5 (abbreviated): $$[\textit{phrase}] \rightarrow \mathbf{H}\boxed{1}\begin{bmatrix} \text{COMPS} & \langle\ \rangle \end{bmatrix} \begin{bmatrix} \text{COMPS} & \langle\ \rangle \\ \text{MOD} & \langle \boxed{1} \rangle \end{bmatrix}$$

Evolution of Another Phrase Structure Rule

Ch. 2: X --> X^{+} CONJ X

Ch. 3: $\boxed{1} \rightarrow \boxed{1}^{+} \begin{bmatrix} \textit{word} & \\ \text{HEAD} & \textit{conj} \end{bmatrix} \boxed{1}$

Ch. 4: $\begin{bmatrix}\text{VAL } \boxed{1}\end{bmatrix} \rightarrow \begin{bmatrix}\text{VAL } \boxed{1}\end{bmatrix}^{+} \begin{bmatrix} \textit{word} & \\ \text{HEAD} & \textit{conj} \end{bmatrix} \begin{bmatrix}\text{VAL } \boxed{1}\end{bmatrix}$

Ch. 5: $\begin{bmatrix} \text{SYN} & [\text{VAL } \boxed{0}] \\ \text{SEM} & [\text{IND } s_0] \end{bmatrix} \rightarrow$

$$\begin{bmatrix} \text{SYN} & [\text{VAL } \boxed{0}] \\ \text{SEM} & [\text{IND } s_1] \end{bmatrix} \ldots \begin{bmatrix} \text{SYN} & [\text{VAL } \boxed{0}] \\ \text{SEM} & [\text{IND } s_{n-1}] \end{bmatrix} \begin{bmatrix} \text{SYN} & \begin{bmatrix}\text{HEAD} & \textit{conj}\end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{IND} & s_0 \\ \text{RESTR} & \left\langle \begin{bmatrix}\text{ARGS } \langle s_1 \ldots s_n \rangle\end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \begin{bmatrix} \text{SYN} & [\text{VAL } \boxed{0}] \\ \text{SEM} & [\text{IND } s_n] \end{bmatrix}$$

Ch. 5 (abbreviated):

$$\begin{bmatrix} \text{VAL} & \boxed{0} \\ \text{IND} & s_0 \end{bmatrix} \rightarrow \begin{bmatrix} \text{VAL} & \boxed{0} \\ \text{IND} & s_1 \end{bmatrix} \ldots \begin{bmatrix} \text{VAL} & \boxed{0} \\ \text{IND} & s_{n-1} \end{bmatrix} \begin{bmatrix} \text{HEAD} & \textit{conj} \\ \text{IND} & s_0 \\ \text{RESTR} & \left\langle \begin{bmatrix}\text{ARGS } \langle s_1 \ldots s_n \rangle\end{bmatrix} \right\rangle \end{bmatrix} \begin{bmatrix} \text{VAL} & \boxed{0} \\ \text{IND} & s_n \end{bmatrix}$$

Combining Constraints and Coordination

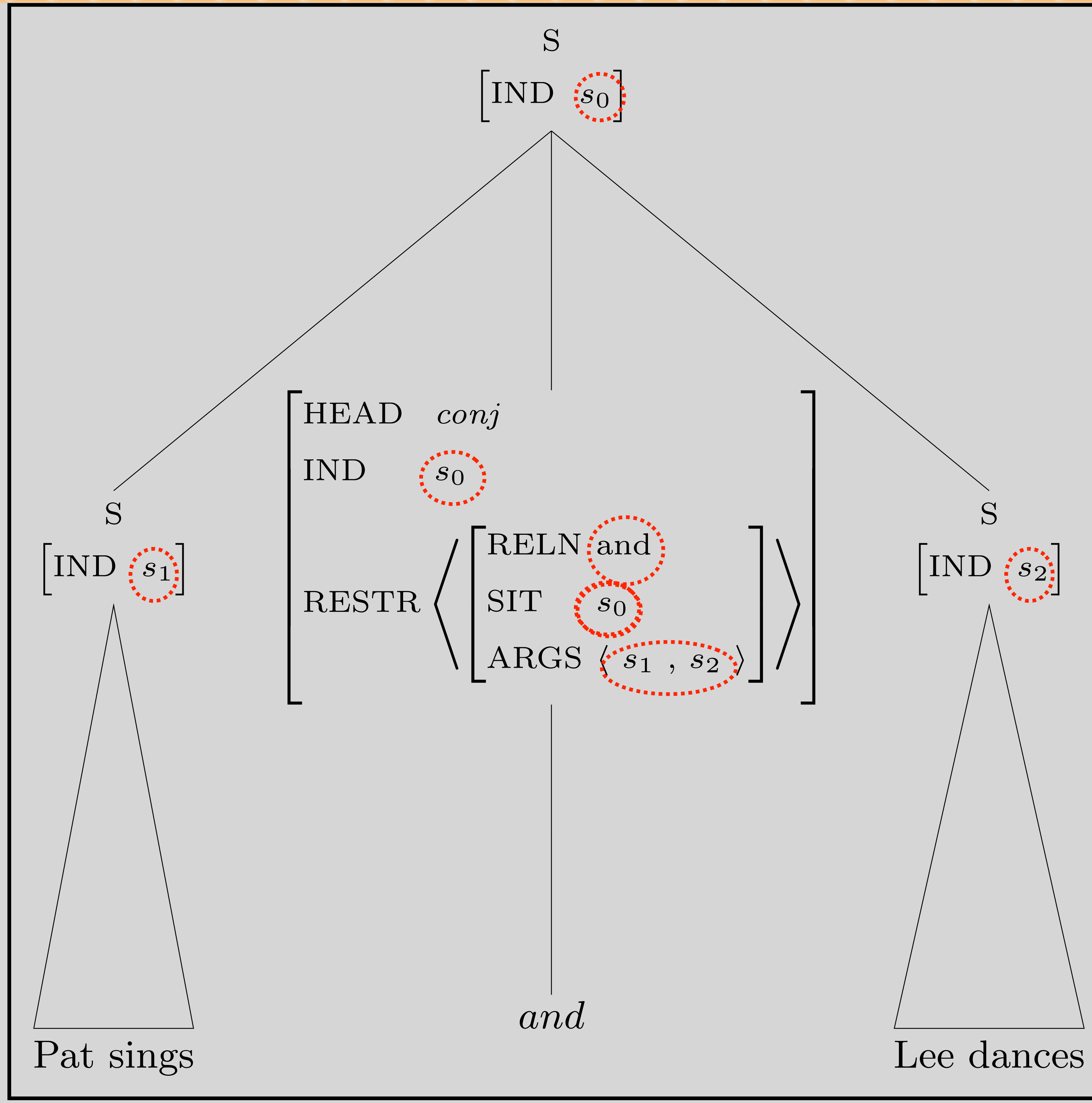
Coordination Rule

$$\begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_0\end{bmatrix} \rightarrow \begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_1\end{bmatrix} \ldots \begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_{n-1}\end{bmatrix} \begin{bmatrix}\text{HEAD} & \textit{conj}\\ \text{IND} & s_0\\ \text{RESTR} & \left\langle\begin{bmatrix}\text{ARGS} & \langle s_1 \ldots s_n\rangle\end{bmatrix}\right\rangle\end{bmatrix} \begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_n\end{bmatrix}$$

Lexical Entry for a Conjunction

$$\left\langle \text{and}\ ,\ \begin{bmatrix}\text{SYN} & \begin{bmatrix}\text{HEAD} & \textit{conj}\end{bmatrix}\\ \text{SEM} & \begin{bmatrix}\text{INDEX} & s\\ \text{MODE} & \text{none}\\ \text{RESTR} & \left\langle\begin{bmatrix}\text{RELN} & \text{and}\\ \text{SIT} & s\end{bmatrix}\right\rangle\end{bmatrix}\end{bmatrix}\right\rangle$$

Combining Constraints and Coordination



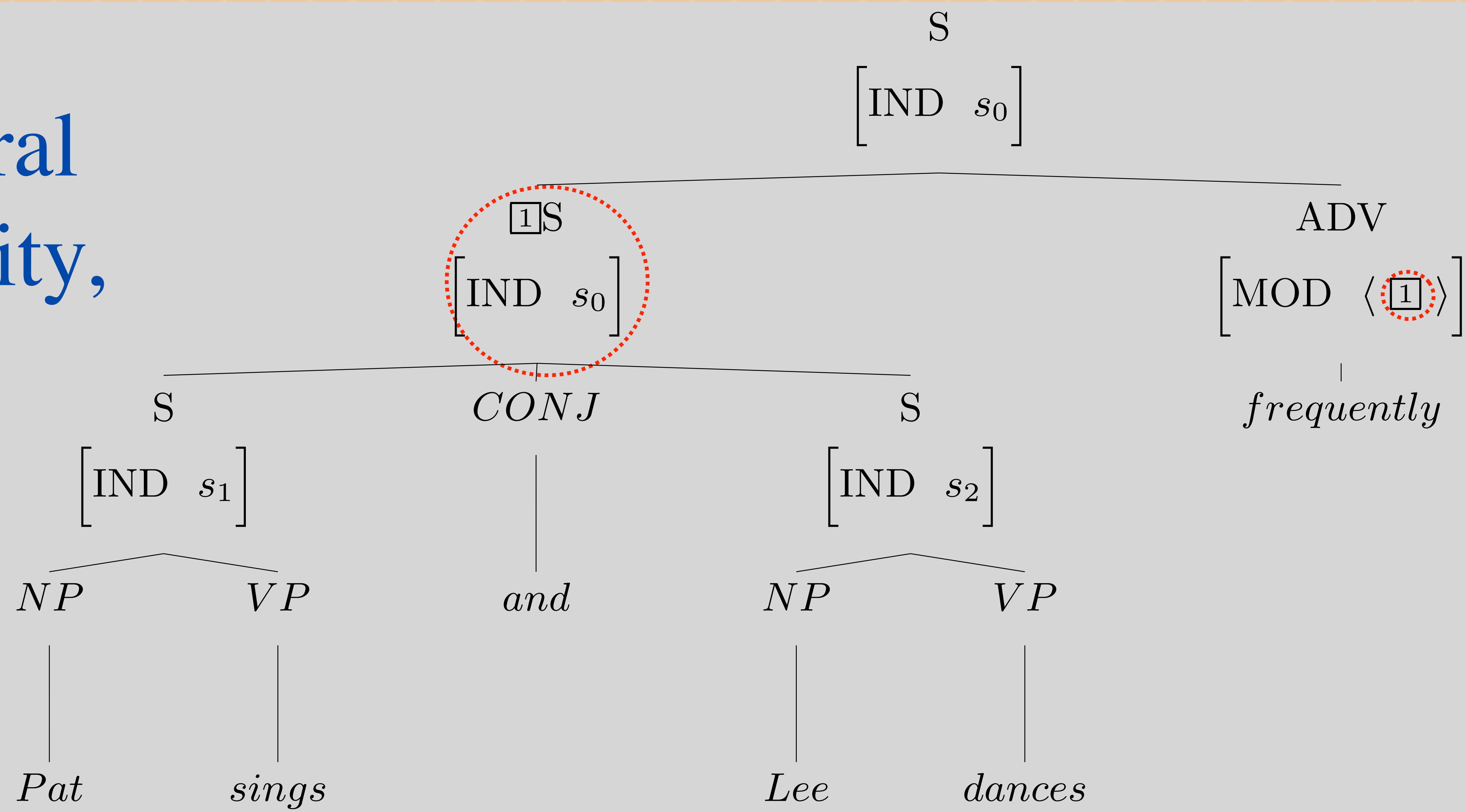
Lexical Entry for *and*

$$\left\langle \text{and}\ ,\ \begin{bmatrix} \text{SYN} & \begin{bmatrix}\text{HEAD} & \textit{conj}\end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{MODE} & \text{none} \\ \text{RESTR} & \left\langle \begin{bmatrix}\text{RELN} & \text{and}\\ \text{SIT} & s\end{bmatrix}\right\rangle \end{bmatrix}\end{bmatrix}\right\rangle$$

Coordination Rule

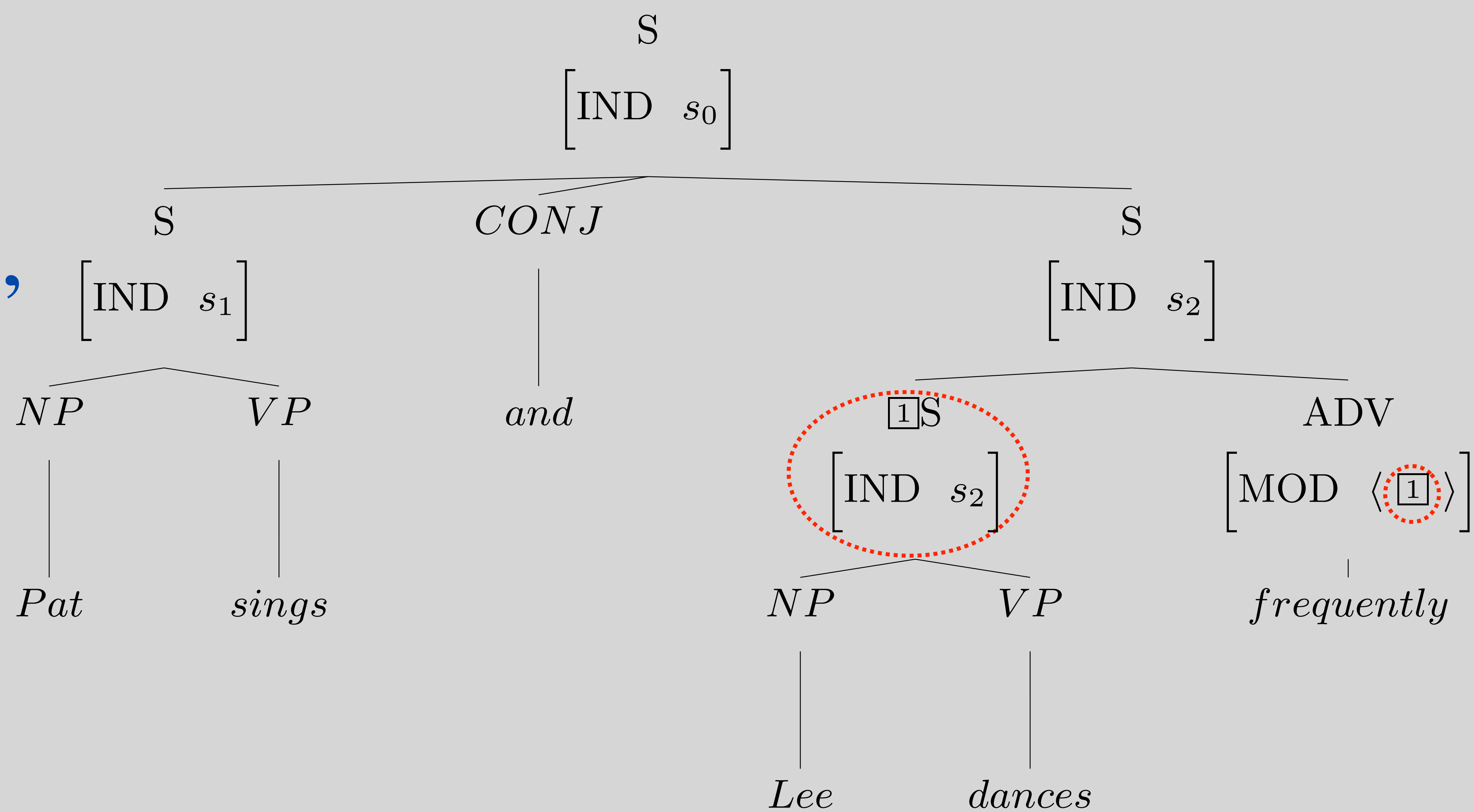
$$\begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_0\end{bmatrix} \rightarrow \begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_1\end{bmatrix} \ldots \begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_{n-1}\end{bmatrix} \begin{bmatrix}\text{HEAD} & \textit{conj}\\ \text{IND} & s_0 \\ \text{RESTR} & \left\langle\begin{bmatrix}\text{ARGS} & \langle s_1 \ldots s_n\rangle\end{bmatrix}\right\rangle\end{bmatrix} \begin{bmatrix}\text{VAL} & \boxed{0}\\ \text{IND} & s_n\end{bmatrix}$$

Structural Ambiguity, Tree I



$$\begin{bmatrix} \text{IND} & s_0 \\ \text{MODE} & \text{prop} \\ \text{RESTR} & \left\langle \begin{array}{lll} \begin{bmatrix}\text{RELN} & \text{name}\\ \text{NAME} & \text{Pat}\\ \text{NAMED} & \text{k}\end{bmatrix}, & \begin{bmatrix}\text{RELN} & \text{sing}\\ \text{SIT} & s_1\\ \text{SINGER} & \text{k}\end{bmatrix}, & \begin{bmatrix}\text{RELN} & \text{and}\\ \text{SIT} & s_0\\ \text{ARGS} & \langle s_1 , s_2 \rangle\end{bmatrix}, \\ \begin{bmatrix}\text{RELN} & \text{name}\\ \text{NAME} & \text{Lee}\\ \text{NAMED} & \text{j}\end{bmatrix}, & \begin{bmatrix}\text{RELN} & \text{dance}\\ \text{SIT} & s_2\\ \text{DANCER} & \text{j}\end{bmatrix}, & \begin{bmatrix}\text{RELN} & \text{frequently}\\ \text{ARG} & s_0\end{bmatrix} \end{array} \right\rangle \end{bmatrix}$$

Structural Ambiguity, Tree II



$$\begin{bmatrix} \text{IND} & s_0 \\ \text{MODE} & \text{prop} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Pat} \\ \text{NAMED} & \text{k} \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{sing} \\ \text{SIT} & s_1 \\ \text{SINGER} & \text{k} \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{and} \\ \text{SIT} & s_0 \\ \text{ARGS} & \langle s_1 , s_2 \rangle \end{bmatrix}, \atop \begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Lee} \\ \text{NAMED} & \text{j} \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{dance} \\ \text{SIT} & s_2 \\ \text{DANCER} & \text{j} \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{frequently} \\ \text{ARG} & s_2 \end{bmatrix} \right\rangle \end{bmatrix}$$

Question About Structural Ambiguity

Why isn't this a possible semantic representation for the string *Pat sings and Lee dances frequently*?

$$
\begin{bmatrix}
\text{IND} & s_0 \\
\text{MODE} & \text{prop} \\
\text{RESTR} & \left\langle
\begin{array}{l}
\begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Pat} \\ \text{NAMED} & \text{k} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{sing} \\ \text{SIT} & s_1 \\ \text{SINGER} & \text{k} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{and} \\ \text{SIT} & s_0 \\ \text{ARGS} & \langle s_1 , s_2 \rangle \end{bmatrix}, \\
\begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Lee} \\ \text{NAMED} & \text{j} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{dance} \\ \text{SIT} & s_2 \\ \text{DANCER} & \text{j} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{frequently} \\ \text{ARG} & s_1 \end{bmatrix}
\end{array}
\right\rangle
\end{bmatrix}
$$

Semantic Compositionality

$$
\begin{bmatrix}
\text{IND} & s_0 \\
\text{MODE} & \text{prop} \\
\text{RESTR} & \left\langle
\begin{matrix}
\begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Pat} \\ \text{NAMED} & \text{k} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{sing} \\ \text{SIT} & s_1 \\ \text{SINGER} & \text{k} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{and} \\ \text{SIT} & s_0 \\ \text{ARGS} & \langle\, s_1 \,,\, s_2 \,\rangle \end{bmatrix}, \\
\begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Lee} \\ \text{NAMED} & \text{j} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{dance} \\ \text{SIT} & s_2 \\ \text{DANCER} & \text{j} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{frequently} \\ \text{ARG} & s_0 \end{bmatrix}
\end{matrix}
\right\rangle
\end{bmatrix}
$$

$$
\begin{bmatrix}
\text{IND} & s_0 \\
\text{MODE} & \text{prop} \\
\text{RESTR} & \left\langle
\begin{matrix}
\begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Pat} \\ \text{NAMED} & \text{k} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{sing} \\ \text{SIT} & s_1 \\ \text{SINGER} & \text{k} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{and} \\ \text{SIT} & s_0 \\ \text{ARGS} & \langle\, s_1 \,,\, s_2 \,\rangle \end{bmatrix}, \\
\begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Lee} \\ \text{NAMED} & \text{j} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{dance} \\ \text{SIT} & s_2 \\ \text{DANCER} & \text{j} \end{bmatrix},
\begin{bmatrix} \text{RELN} & \text{frequently} \\ \text{ARG} & s_2 \end{bmatrix}
\end{matrix}
\right\rangle
\end{bmatrix}
$$

Overview

- Some notes on the linguist's stance
- Which aspects of semantics we'll tackle
- Our formalization; Semantics Principles
- Building semantics of phrases
- Modification, coordination
- Structural ambiguity
- Next time: How the grammar works

Reading Questions

- So I understand that the INDEX in the SEM value is supposed to be the individuals or situations referred to in a sentence. When an INDEX value starts with s, i.e. sn, it refers to a situation. However, I am still a bit confused as to how this is used in our diagrams. Looking at (36) on page 148, I understand why the index of the VP is s1, but why isn't the INDEX of S both i and s1? As the sentence refers to aching happening to Pat? I assume this has to do with how the VP is the head daughter of S? :)

Reading Questions

- How could we figure out 'GIVER' and 'RECIPIENT' based on the rules and lexicons we have?
- INDEX corresponds to the referent in the world, and words and phrases can share an INDEX that they pick out with varying degrees of specificity because different intensional paths set out by the RESTR to the same referent, no?

Reading Questions

- On p.138, it says that the feature INDEX can take an unlimited number of different values because there is no limit to the number of different individuals or situations which can be referred to in a single sentence. I am not quite sure what it means because in the later examples in this chapter, there is only one value for the feature INDEX.
- In (19)a. and b. why do dog and Kim share the same INDEX value of i? I think the INDEX of the dog should be j.
- And why is the argument SIT omitted in the prediction introduced by dog?

Reading Questions

- I'm a little confused on the motivation behind having RESTR values for nouns. The INSTANCE and NAME values seem semantically vacuous to me. Is it really a semantic restriction that a dog needs to be an instance of a dog? What is the purpose of these restrictions and why can't we leave them out?

Reading Questions

- In the semantic feature structures such as (14) and (17), it seems that we have to specify the feature attributes according to the semantics of the verb, such as SAVER, SAVED, WALKER, LOVER etc. This doesn't look like a generalized rule and makes potential uncertainties. Is there a way to generalize it as action performer which represents the instance who saves, walks, loves etc. and the instance of the affected object who is saved, loved etc?

Reading Questions

- A footnote (14) defines the sum operator to not be communicative and that two lists <A,B> and <B,A> produced by this operator are not equivalent, even though earlier it is claimed that the order of elements in RESTR doesn't matter. Is there a case in which the order of the RESTR feature matters, or can we always assume that RESTR is an unordered set of constraints?

Reading Questions

- How do we deal with modifiers that can appear in various positions in a statement without changing the meaning? E.g. -- I walked slowly to school; I slowly walked to school; I walked to school slowly; slowly, I walked to school. Would we write a different rule for each one? And how do we deal with different types of modifiers having different amounts of mobility? For instance an adverb can usually precede a VP but a prepositional phrase usually can't.

Reading Questions

- As I look at the feature structure (17) on page 140, I am given pause. The number of possible combinations of restrictions that could be applied to a given proposition is innumerable and, as such, must be quite difficult to encode in a computer program. I'm curious if the semantic representations here are realistic to use. It seems like they may be simplified to give a "flavor" for how semantic information may be embedded. If they are realistic, how might a computer actually embed this information?

Reading Questions

- How does any rule-based formalism of language deal with the acceptability of verbs which have many meanings? Some verbs can be used in a variety of contexts like *take*, *got*. Does it lead to errors when so many meanings of a verb are account for in a grammar? I feel like this may come from issues indexing an inputs semantic relationships.

Reading Questions

- I have many questions on this chapter, most of which have already been raised by others. One question I have that's been growing for a couple of chapters is how exactly to use the Type Hierarchy that we keep building on at the end of every chapter. One of my major confusions about the hierarchy is that it places seemingly non-parallel features at the same depth, e.g. expression [SYN SEM] is at the same depth as the syn-cat [HEAD VAL], which itself is at the same depth as val-cat [SPR etc.]. But in the feature structures themselves these are not parallel, but embedded in one another. It seems like I am missing something fundamental here.

Reading Questions

- I'm having trouble wrapping my head around the "resolving" of quantifiers discussed on page 153. The text says that our representation allows unresolved or partially unresolved quantifier scope. I'm only vaguely familiar with predicate logic, so maybe that's what's tripping me up. Can you give an example of a sentence that might have unresolved quantifier scope and reiterate what it is about our semantic representation that allows this underspecification?

Reading Questions

- How does this generalize beyond existential and universal?
- 5.8 got me thinking about the cases with multiple quantifiers. How to deal with cases like "those two dogs" and "every two weeks"?