Grammar 21

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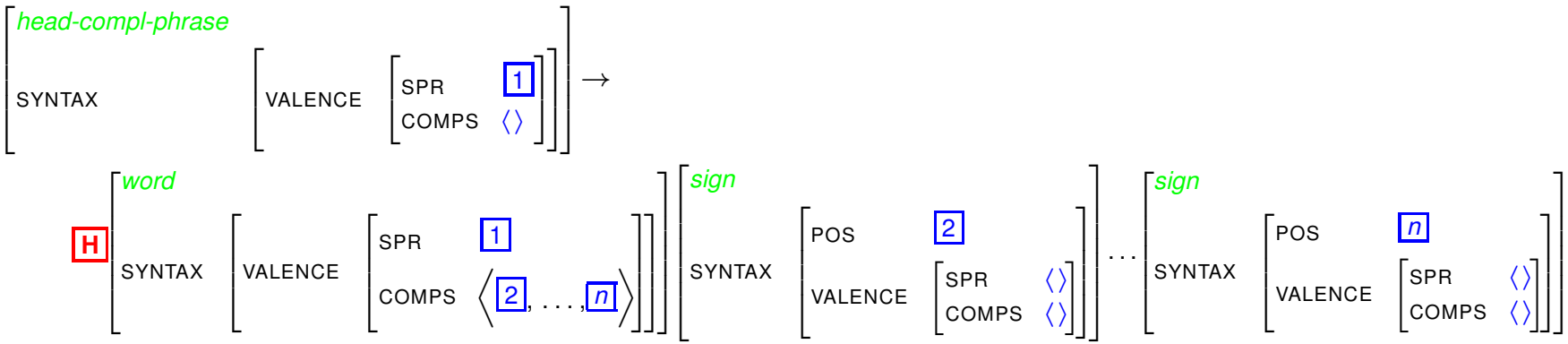
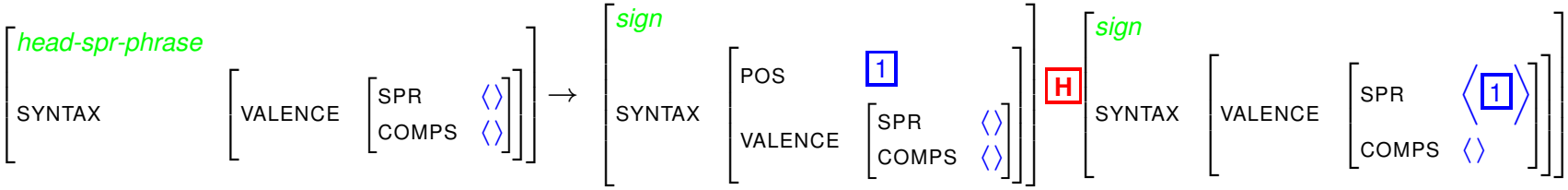
The grammar so far

There are only two grammar rules:

Head-Complement Rule:



Head-Specifier Rule:



The Head Feature Principle (HFP)

The value of HEAD of a phrase is also the value of HEAD of the phrase's head-daughter.

A typical lexical entry

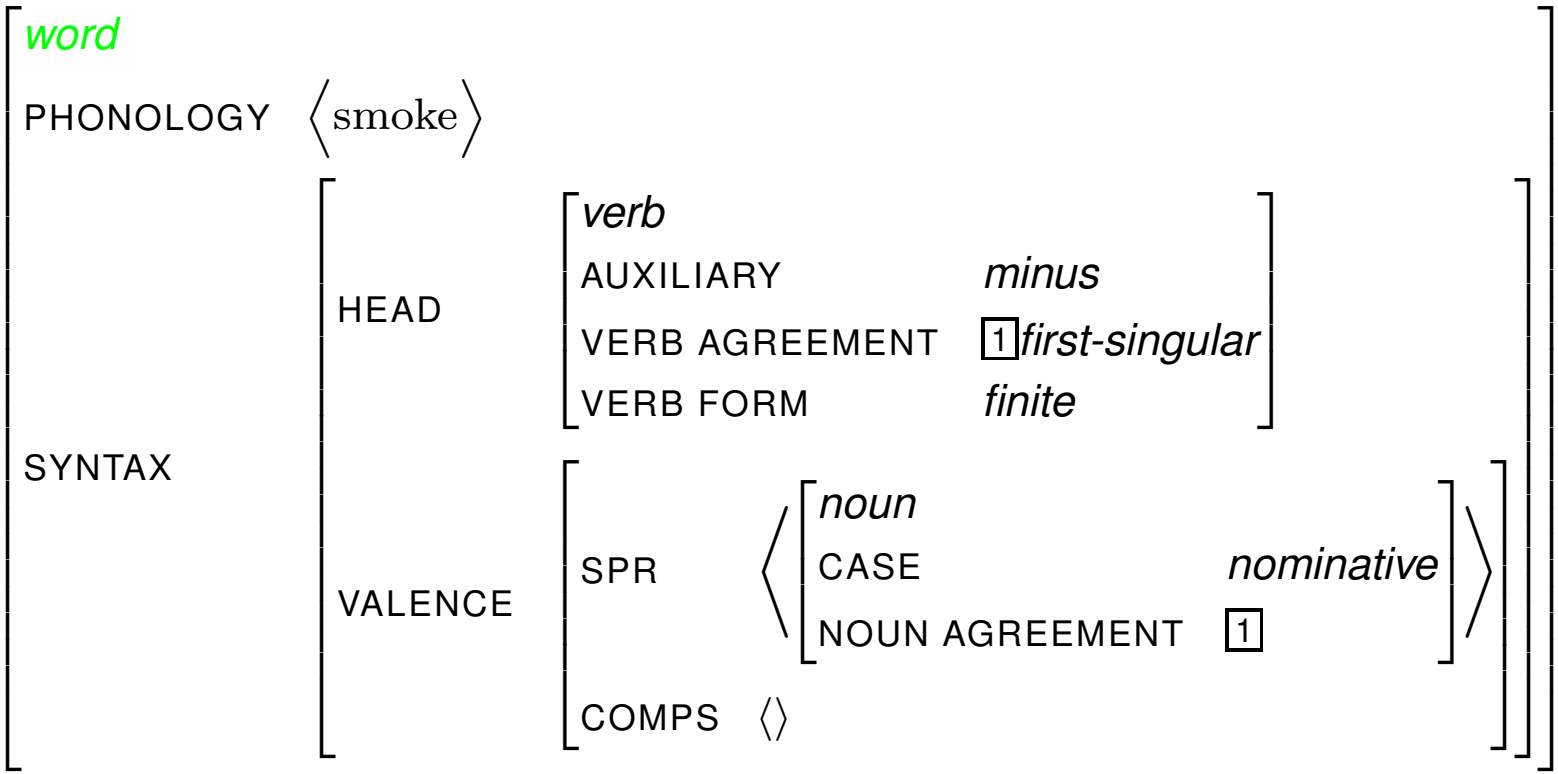


Illustration: the Head-Complement Rule

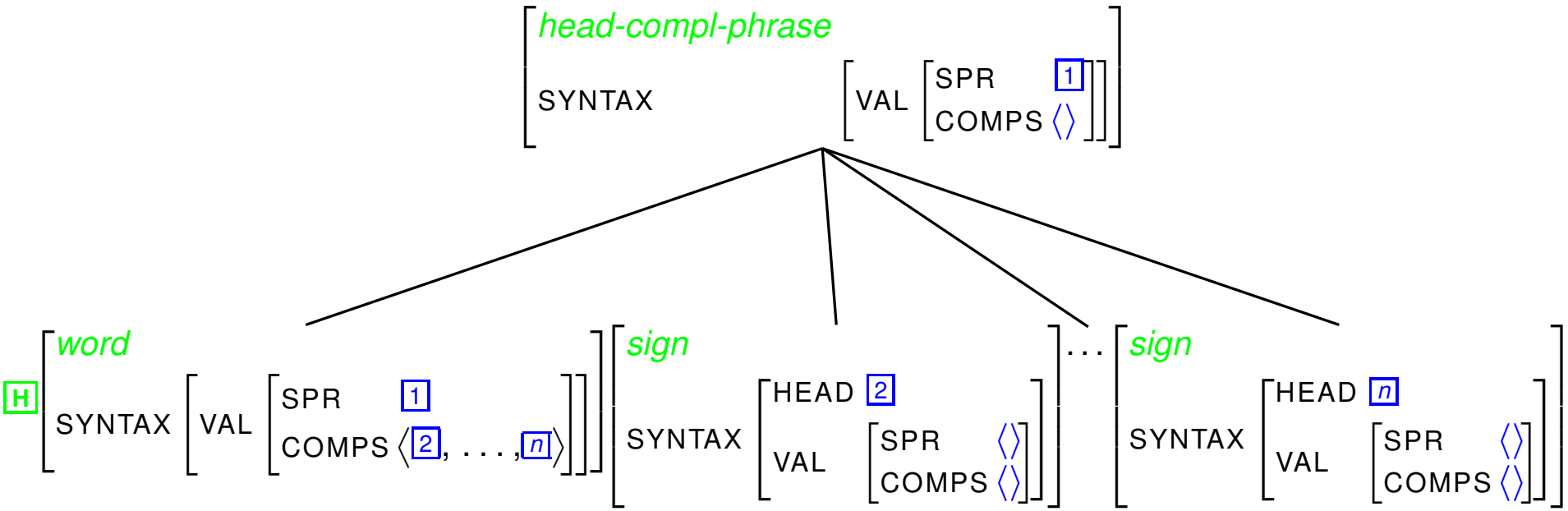
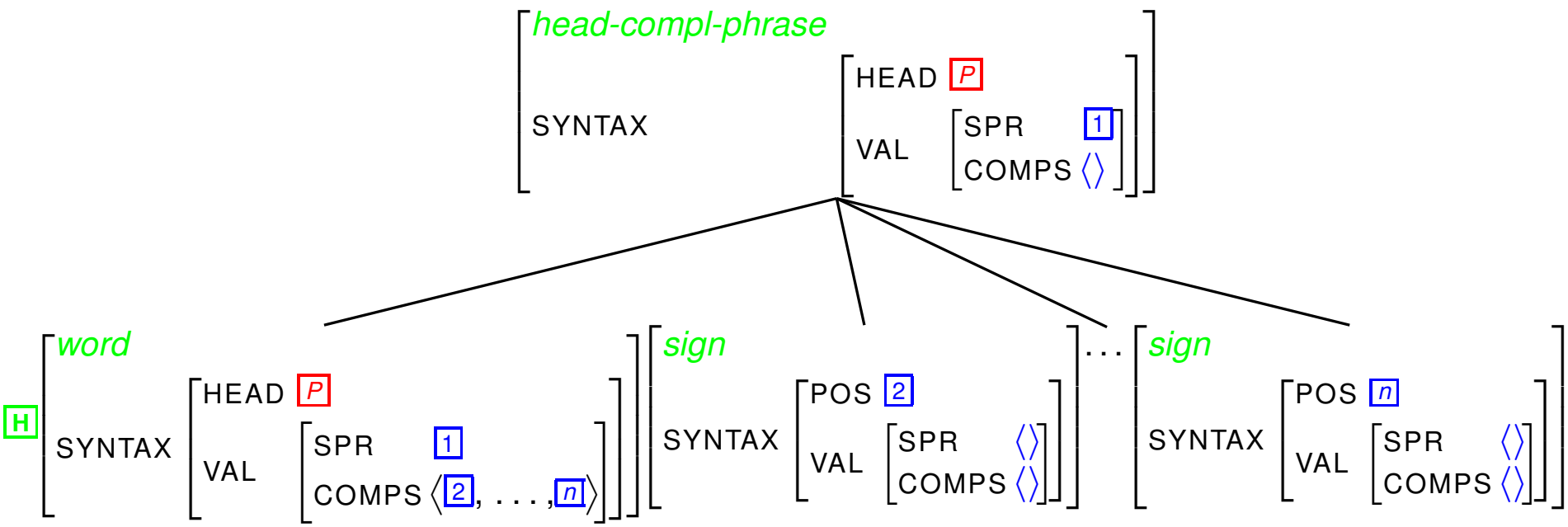


Illustration: the Head-Complement Rule + HFP



- The information in blue and green is a consequence of the Head-Complement Rule.
- The information in red is a consequence of the Head Feature Principle.

Verbal paradigms

Form	Agreement	*eat*	*live*
finite (present)	*third singular*	*eats*	*lives*
finite (present)	*non-third singular*	*eat*	*live*
finite (past)	*agreement*	ate	lived
bare	*agreement*	*eat*	*live*
progressive	*agreement*	*eating*	*living*
perfect	*agreement*	*eaten*	*lived*

A citation form for the word family *eat*

$$\left[\begin{array}{ll} \textit{verb-lexeme} & \\ \text{PHONOLOGY} & \langle \text{eat} \rangle \\ \text{SYNTAX} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \textit{verb} & \\ \text{AUXILIARY} & \textit{minus} \end{array}\right] \\ \text{VALENCE} & \left[\begin{array}{ll} \text{SPECIFIER} & \langle [\textit{noun}] \rangle \\ \text{COMPLEMENTS} & \langle [\textit{noun}] \rangle \end{array}\right] \end{array}\right] \end{array}\right]$$

Lexical rules for main verbs

The third person singular present tense lexical rule:

$$\begin{bmatrix} \textit{verb-lexeme} \\ \text{PHONOLOGY} \quad \langle \boxed{1} \rangle \\ \text{SYNTAX} \quad \begin{bmatrix} \text{HEAD} \quad \begin{bmatrix} \text{AUXILIARY} \quad \textit{minus} \end{bmatrix} \end{bmatrix} \end{bmatrix} \mapsto$$

$$\begin{bmatrix} \textit{word} \\ \text{PHONOLOGY} \quad \left\langle \textsc{function-3sg-present-verb}\left(\boxed{1}\right) \right\rangle \\ \text{SYNTAX} \quad \begin{bmatrix} \text{HEAD} \quad \begin{bmatrix} \text{VERB FORM} & \textit{finite} \\ \text{VERB AGREEMENT} & \textit{third-singular} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Things to note:

1. The arrow in lexical rules is $\mapsto$, which is different from the arrow in phrase structure rules, which is $\rightarrow$.
2. A lexical rule has the following meaning: for every object in the grammar that satisfies the description of the input of the rule, there is a well formed object in the grammar with the following properties:
   1. The new object has all the properties described for the output of the rule **and**
   2. all the properties of the input that do not conflict with the description for the output!

Applying the 3rd-sg present tense verb lexical rule to the verb lexeme *eat*

The input lexeme:

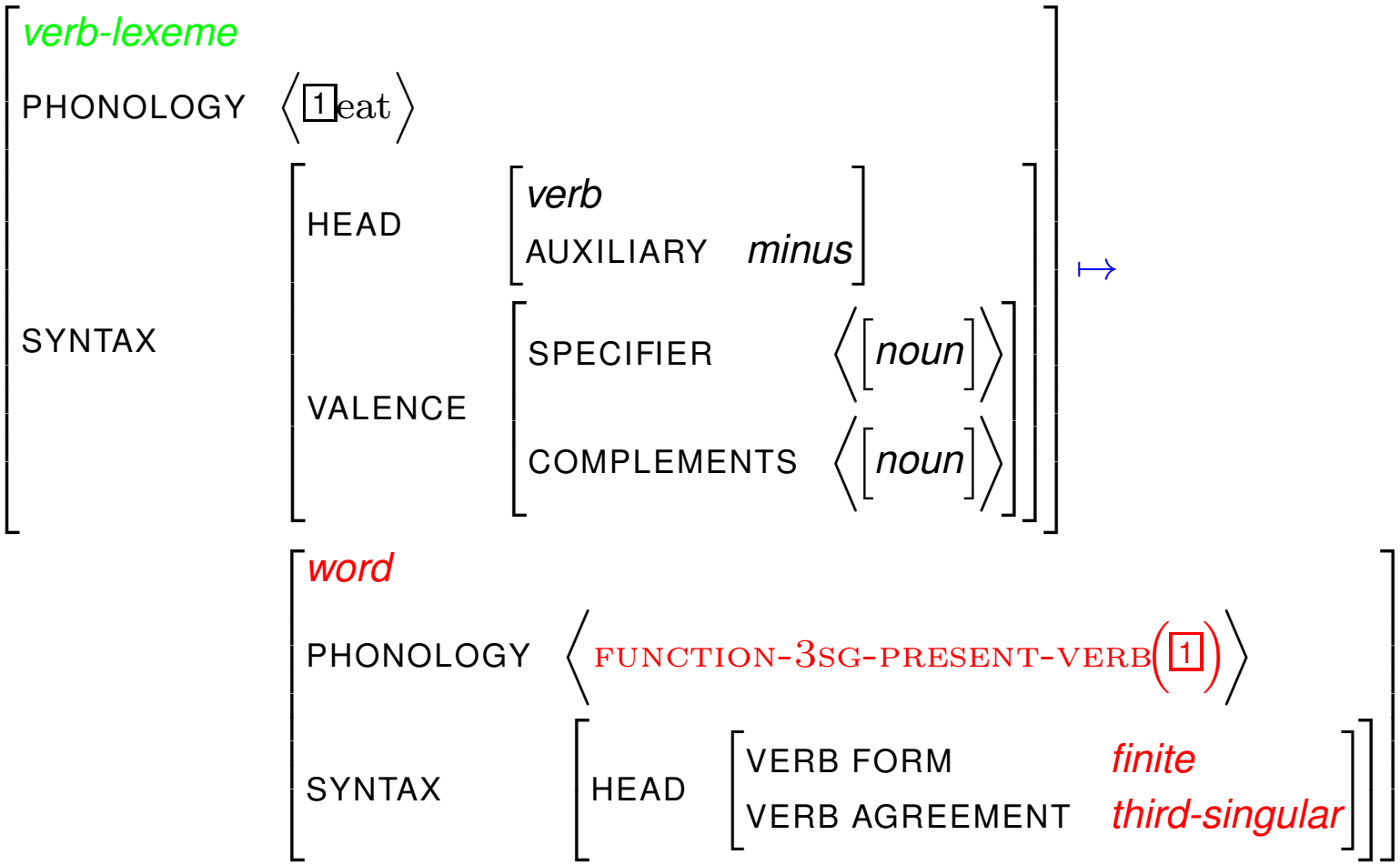
$$\begin{bmatrix} \textit{verb-lexeme} \\ \text{PHONOLOGY} & \langle \text{eat} \rangle \\ \text{SYNTAX} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} \\ \text{AUXILIARY} & \textit{minus} \end{bmatrix} \\ \text{VALENCE} & \begin{bmatrix} \text{SPECIFIER} & \langle [\textit{noun}] \rangle \\ \text{COMPLEMENTS} & \langle [\textit{noun}] \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The third person singular present tense lexical rule:

$$\begin{bmatrix} \textit{verb-lexeme} \\ \text{PHONOLOGY} & \langle \boxed{1} \rangle \\ \text{SYNTAX} & [\text{HEAD} \; [\text{AUXILIARY} \; \textit{minus}]] \end{bmatrix} \mapsto \begin{bmatrix} \textit{word} \\ \text{PHONOLOGY} & \langle \text{FUNCTION-3SG-PRESENT-VERB}(\boxed{1}) \rangle \\ \text{SYNTAX} & [\text{HEAD} \; [\text{VERB FORM} \; \textit{finite}, \; \text{VERB AGREEMENT} \; \textit{third-singular}]] \end{bmatrix}$$

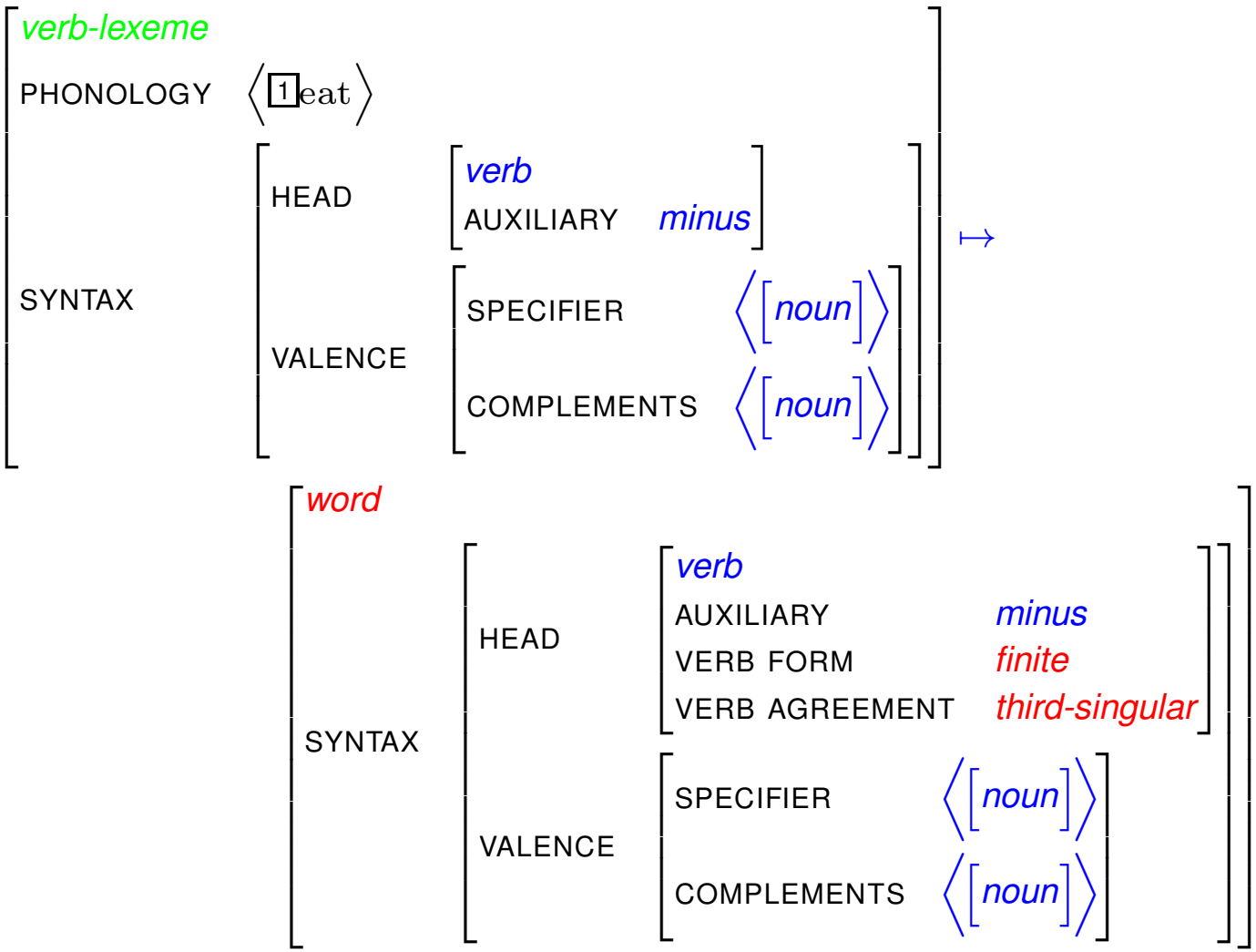
Step 1: inserting the lexeme into the input of the rule

The third person singular present tense lexical rule with input *eat*:



Step 2: copying all the properties that do not conflict from the input to the output (in blue)

The third person singular present tense lexical rule with input *eat*:



The inflected word still lacks a phonology!

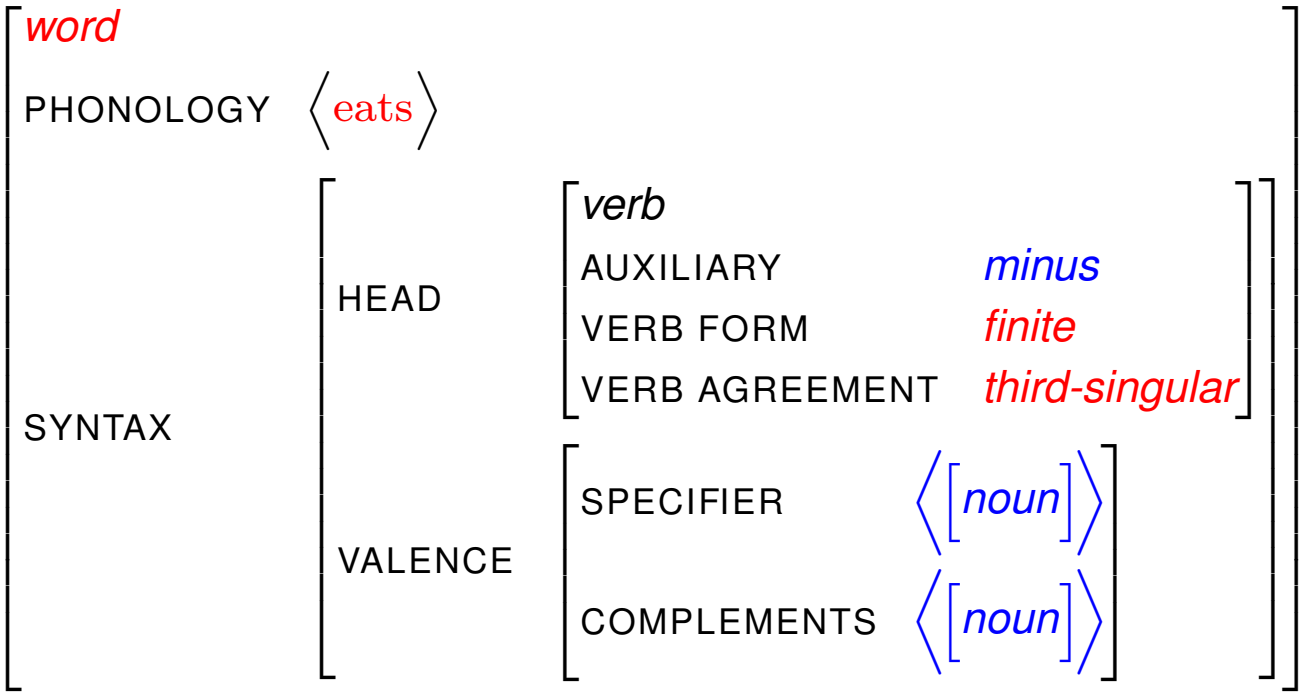
$$\begin{bmatrix} \textit{word} \\ \text{PHONOLOGY} & \textit{???} \\ \text{SYNTAX} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} \\ \text{AUXILIARY} & \textit{minus} \\ \text{VERB FORM} & \textit{finite} \\ \text{VERB AGREEMENT} & \textit{third-singular} \end{bmatrix} \\ \text{VALENCE} & \begin{bmatrix} \text{SPECIFIER} & \langle [\textit{noun}] \rangle \\ \text{COMPLEMENTS} & \langle [\textit{noun}] \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The phonology needs to be supplied by a function, because it is dependent on the phonology of the input:

Lexeme	Third singular
eat	eats
kiss	kisses
...	

Let us assume that the function FUNCTION-3SG-PRESENT-VERB is defined in the right way!

The third person singular present tense word eats



- The information in red comes from the lexical rule.
- The information in blue is inherited from the verb lexeme *eat*.

Exercises

1. Write a lexical rule that creates non-third person present tense words from non-auxiliary verb lexemes.
2. Give the output for the verb lexeme *live*.
3. Write a lexical rule that creates past tense words from non-auxiliary verb lexemes.
4. We will need a function that determines the phonology of the output. Why?
5. Write a part of the definition of this function that can deal with at least the inputs *eat* and *live*.
6. Give the output for the verb lexeme *eat*.

Two constraints

Problem 1:

Finite verb words must have subjects with the following two properties:

1. The case of the subject is nominative.
2. The subject agrees with the verb.

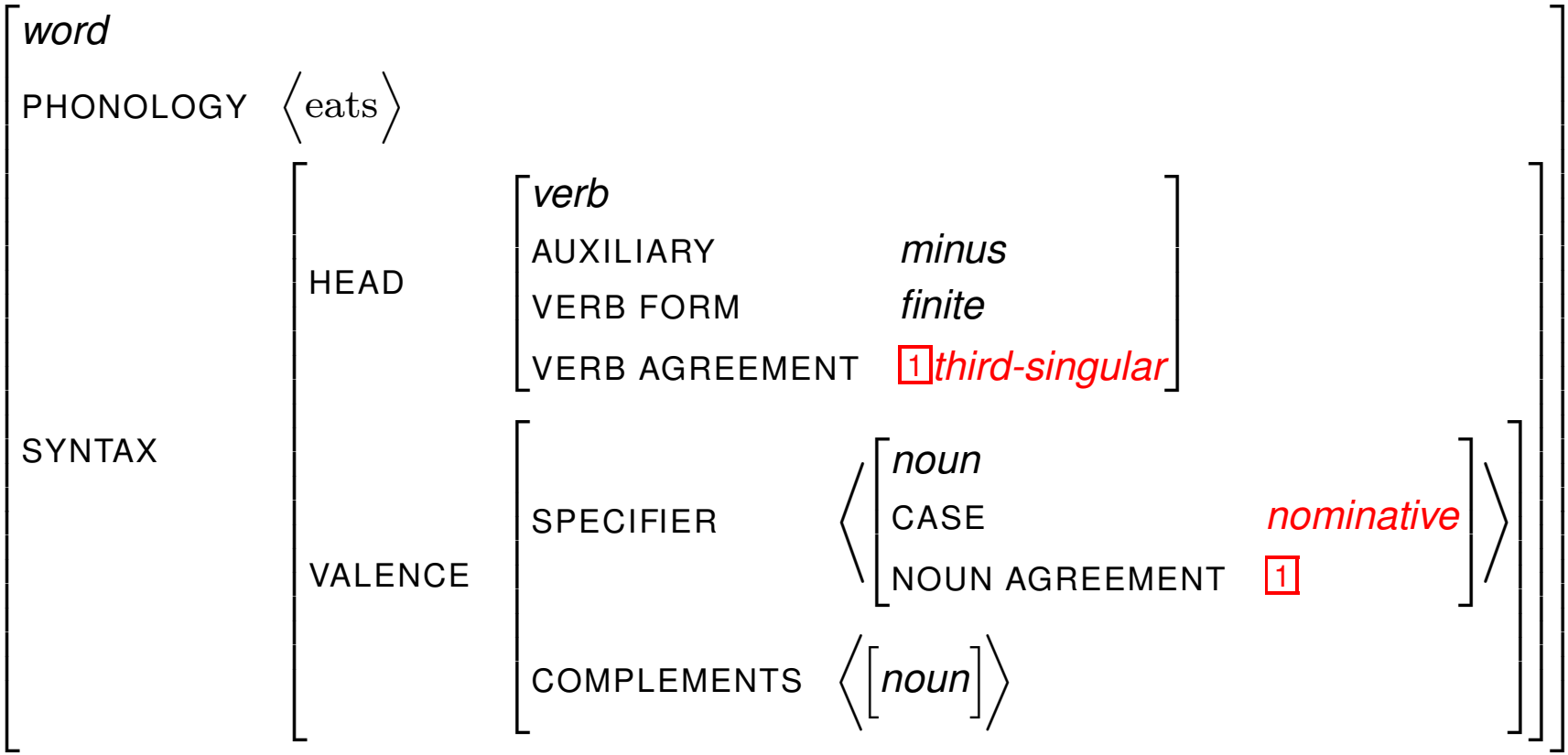
Here is the constraint on finite verb words (only words!) that accomplishes this:

$$\left[\begin{array}{l} \textit{word} \\ \text{SYNTAX} \quad \left[\text{HEAD} \quad \left[\begin{array}{ll} \textit{verb} & \\ \text{VERB FORM} & \textit{finite} \end{array}\right]\right] \end{array}\right] \Rightarrow$$

$$\left[\begin{array}{l} \textit{word} \\ \text{SYNTAX} \quad \left[\begin{array}{ll} \text{HEAD} & \left[\text{VERB AGREEMENT } \boxed{1}\right] \\ \text{VALENCE} & \left[\text{SPECIFIER} \quad \left\langle \left[\begin{array}{lll} \textit{noun} & & \\ \text{CASE} & & \textit{nominative} \\ \text{NOUN AGREEMENT} & \boxed{1} & \end{array}\right] \right\rangle\right] \end{array}\right] \end{array}\right], \text{ AND}$$

$\boxed{1}$ is one of the six possible agreement types!

Applying the constraint to the finite word *eats*



Two constraints

Problem 2:

Nominal complements of verb words (finite and non-finite) and prepositions must be required to have accusative case by their selectors. Here is the constraint that ensures this to be the case:

The Accusative Case Principle

For every item [1] *noun* on the COMPLEMENT list of a word, it is true that

$$[1]\begin{bmatrix} \textit{noun} \\ \text{CASE} \quad \textit{accusative} \end{bmatrix}.$$

The lexical rules are restricted to main verbs

- In principle, it is possible to derive the inflected forms of auxiliaries by lexical rule as well.
- However, many auxiliaries have incomplete paradigms:
  1. The modals lack non-finite forms, e.g. **to must, is musting, has musted.*
  2. The progressive auxiliary lacks a progressive form: **is being eating*.
  3. The perfective auxiliary lacks progressive and perfect forms: **is having eaten, *has had eaten.*
- Therefore, it is easier to simply list all the word forms of each auxiliary that exist!