

# Parsing with Linguistic Features

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# Today's lecture

- 1 Earley parsing with feature structures
- 2 Semantic features
- 3 Homework 4

# Incorporating features into a parser

How would we parse with feature structures?

- *these pens*
- *\*this pens*

NP → • DT Nom

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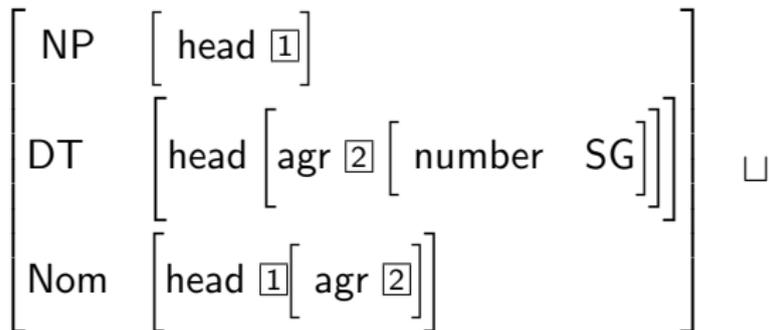
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NP → DT • Nom



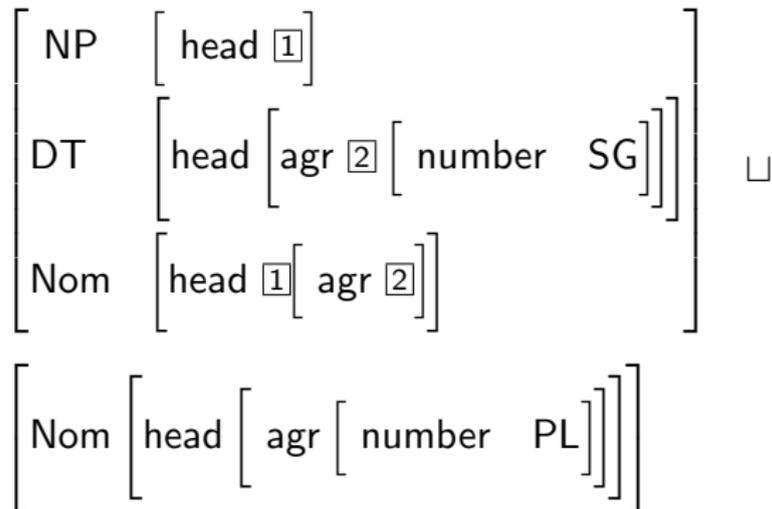
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These structures will not unify, so no new structure will be entered into chart by completer.

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- **noun class** (e.g., Chinese)

# Tense in Cocama-Cocamilla

## Example

Ritama- ca tuts- **ui**  
town- to go- **HOD.PST**  
'I went to town today.'

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## Example

Ritama- ca tutsu- **tsuri**  
town- to go- **REM.PST**  
'I went to town a long time ago.'

# What makes a good feature?

Posit a feature when there is some contrast in the grammar.

## Example

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In Cocama-Cocamilla, there seems to be a required **remoteness** feature, orthogonal to but dependent on the tense feature, cf. the remote future to the remote past.

# Morphosyntactic features

## Definition

A **morphosyntactic feature** is a grammatical feature that influences the morphological or syntactic behavior of the units it associates with.

# Some English grammatical phenomena

- number feature on nouns

these cats

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- countable feature on nouns  
I am going to get my hair cut .  
?I am going to get my hairs cut .

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A **semantic feature** is a grammatical feature that influences the semantic behavior of the units it associates with. By *semantic behavior* I refer to the way meaning is constructed (more on that in a later lecture).

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## Example

?Colorless green ideas sleep furiously.

# Semantic feature inventory

Many types of semantic features have been posited:

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Homework 4

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## Example

The woman<sub>i</sub> said she<sub>i</sub> was ill .

?The woman<sub>i</sub> said he<sub>i</sub> was ill .

# More examples

## Example

the woman finished the race in ten minutes .

?the woman finished the race for ten minutes .

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### Example

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A possible semantic feature is **event contour** with values  
{*instantaneous, durational, inceptive, ...*}

# More examples

## Example

bald men and rocks are smooth .

?bald men and rocks are smooth .

# More examples

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A possible semantic feature is **Animacy** with values  
*⟨Animate, Inanimate⟩*

# More examples

## Example

the water is in the glass .

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the water is in the glass .

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A possible semantic feature is **Countability** with values  
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horses eat hay .

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horses eat hay .

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A possible semantic feature is **Edibility** with values  
⟨*Edible*, *Inedible*⟩

# Semantic features and parsing

Semantic features can be useful for parsing, e.g., adjective scoping:

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## Example

(Sleeping men) and (books) lie flat.

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## Example

? (Sleeping (men and books) lie flat.

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# Homework 4

- Worth 10 pts. (10% of grade)
- Write a grammar using various morphosyntactic and semantic features
- Parse simple sentences using the feature-enabled Earley chart parser
- Return no parse for ungrammatical sentences