

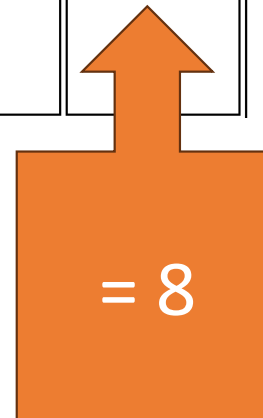
# LING/C SC/PSYC 438/538

Lecture 27

Sandiway Fong

# Course Surveys

| SCS Start/End                    | Term-Session | Combined Section Members   | Enrolled | Instructors   | Response Rate |
|----------------------------------|--------------|--|----------|---------------|---------------|
| 2023-11-09<br><b>2023-12-06*</b> | 2234-1       | <b>0200 LING 438 XLIST 001</b><br>CSC-438-001-39807-LEC<br>CSC-538-001-38141-LEC<br>LING-438-001-38139-LEC<br>LING-538-001-38142-LEC<br>PSY-438-001-44067-LEC<br>PSY-538-001-38140-LEC | 29       | Sandiway Fong | 27.59%        |



# Today's Topics

- 538 Presentations
  - (by midnight) **the night before your presentation you, you must email me your slides!**
- Last time, we wrote our first natural language CFG
  - *live demo*
  - File: g26.prolog
- Homework 14

What I have so far ...

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# Natural Language Grammar

- POS tag to grammar rule:
  - $\text{tag}(\text{tag}(\textit{word})) \rightarrow [\textit{word}]$ .
- Phrasal tag to grammar rule ( $n$ -ary branching):
  - $\text{tag}(\text{tag}(\textit{Subphrase}_1, \dots, \textit{Subphrase}_n)) \rightarrow \text{tag}_1(\textit{Subphrase}_1), \dots, \text{tag}_n(\textit{Subphrase}_n)$ .
- **note:**
  - Python: quoted: names; unquoted: variables or keywords
  - Prolog doesn't use quoting for names
  - use lowercase for tags and words
  - *variables begin with an uppercase letter (unless quoted)*

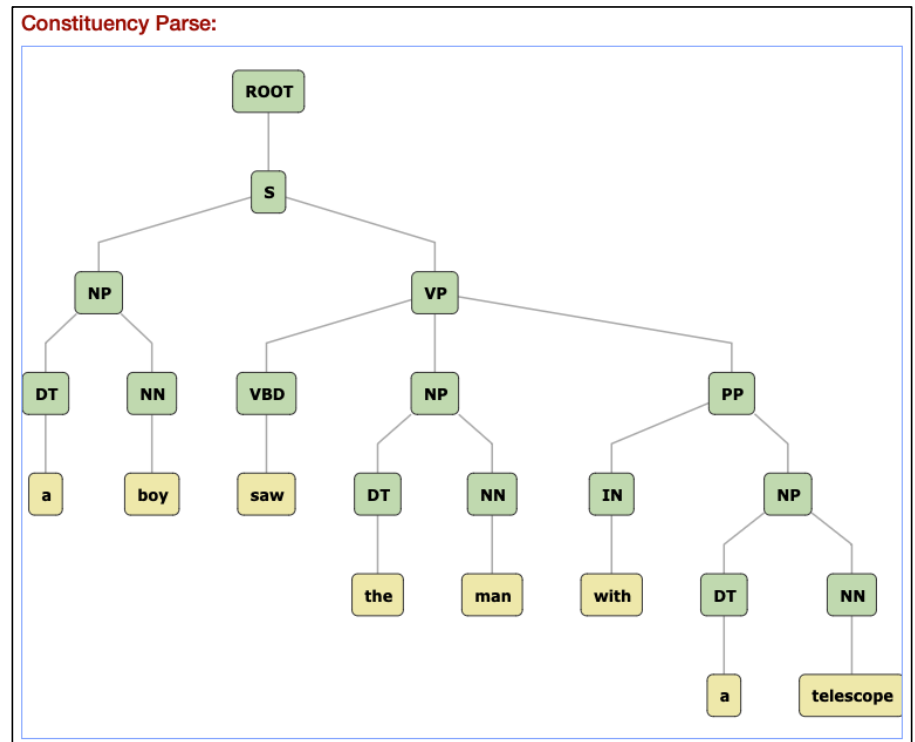
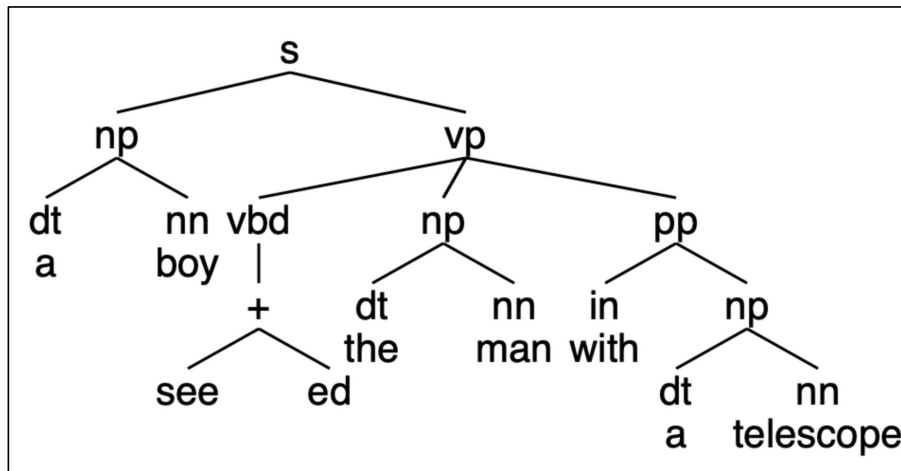


# Natural Language Grammar

- g26.prolog:

```
1 dt(dt(a)) --> [a].␣
2 dt(dt(the)) --> [the].␣
3 vbd(vbd(see+ed)) --> [saw].␣
4 nn(nn(Noun)) --> [Noun] , {member(Noun, [man, boy, telescope])}.␣
5 in(in(with)) --> [with].␣
6 np(np(DT, NN)) --> dt(DT), nn(NN).␣
7 pp(pp(IN, NP)) --> in(IN), np(NP).␣
8 vp(vp(VBD, NP, PP)) --> vbd(VBD), np(NP), pp(PP).␣
9 s(s(NP, VP)) --> np(NP), vp(VP).|
```

# Natural Language Grammar





# Homework 14

- Question 1: *a boy saw the man with a telescope* is structurally ambiguous. Add a grammar rule so you get the other reading.
  - What rule did you add to `g26.prolog`?
  - Demonstrate that your grammar gets the ambiguity when run.
  - Show the two parses.

# Homework 14





- Question 2:
  - Is ChatGPT right about this?
  - Explain.

 **You**  
a boy saw the man with a telescope. Is this sentence ambiguous?

 **ChatGPT**  
Yes, the sentence "A boy saw the man with a telescope" is ambiguous because it could be interpreted in two different ways:

1. The boy saw a man who had a telescope.
2. The boy, who had a telescope, saw a man.

In the first interpretation, the man is the one with the telescope, and in the second interpretation, the boy is the one with the telescope. The placement of the prepositional phrase "with a telescope" creates this ambiguity.

# Homework 14

- Question 3: *a boy saw the man with a gun.*
  - What does <http://stanza.run> give as the parse?
  - Is it correct? Explain.
- Question 4: let's experiment with <http://stanza.run>.
  - Explore if Stanza always **attaches high** (to the VP) and not to the object NP (**attach low**) for a sentence ending PP-*with*?
  - Find a sentence such that Stanza produces the pattern:
    - *Subject Verb Object* [<sub>PP</sub> [<sub>IN</sub> *with*] NP]]
    - for which **low attachment** for PP-*with* is true?

# Homework 14

- Usual rules
- 438/538 Homework 14 *YOUR NAME*
- One PDF file please