

LING/C SC 581:

Advanced Computational Linguistics

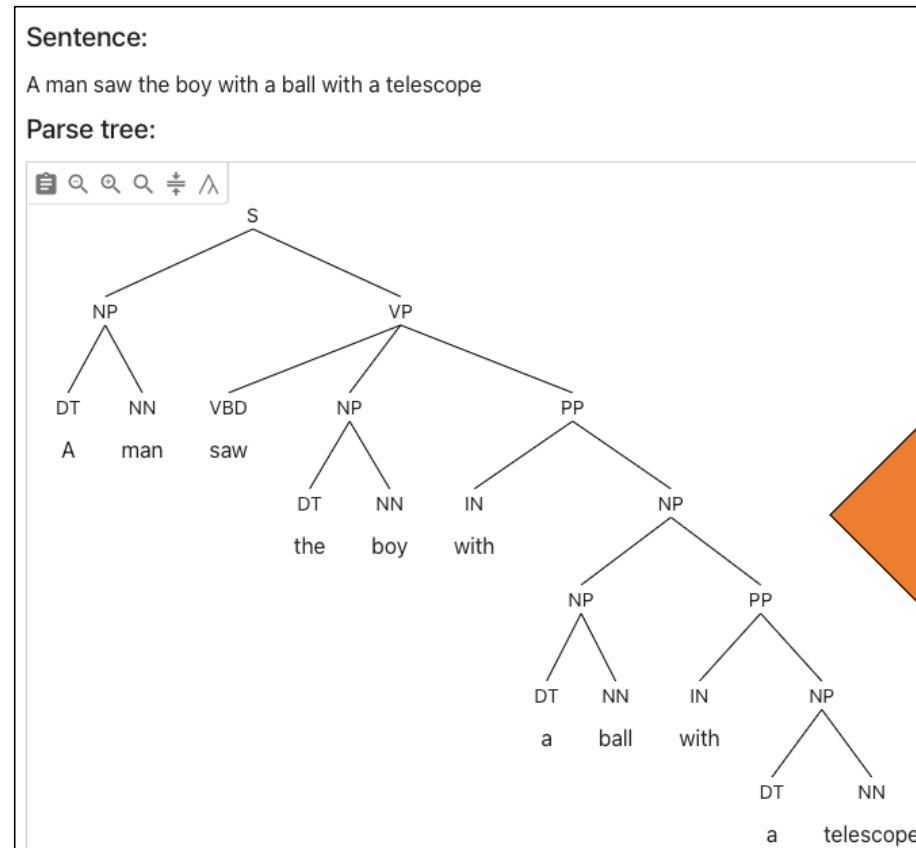
Lecture 8

Today's Topics

- Homework 4 Aside: stacking PPs
- Anaphora
- Homework 4 Questions?
 - *note deadline is Wednesday midnight*

Homework 4 aside

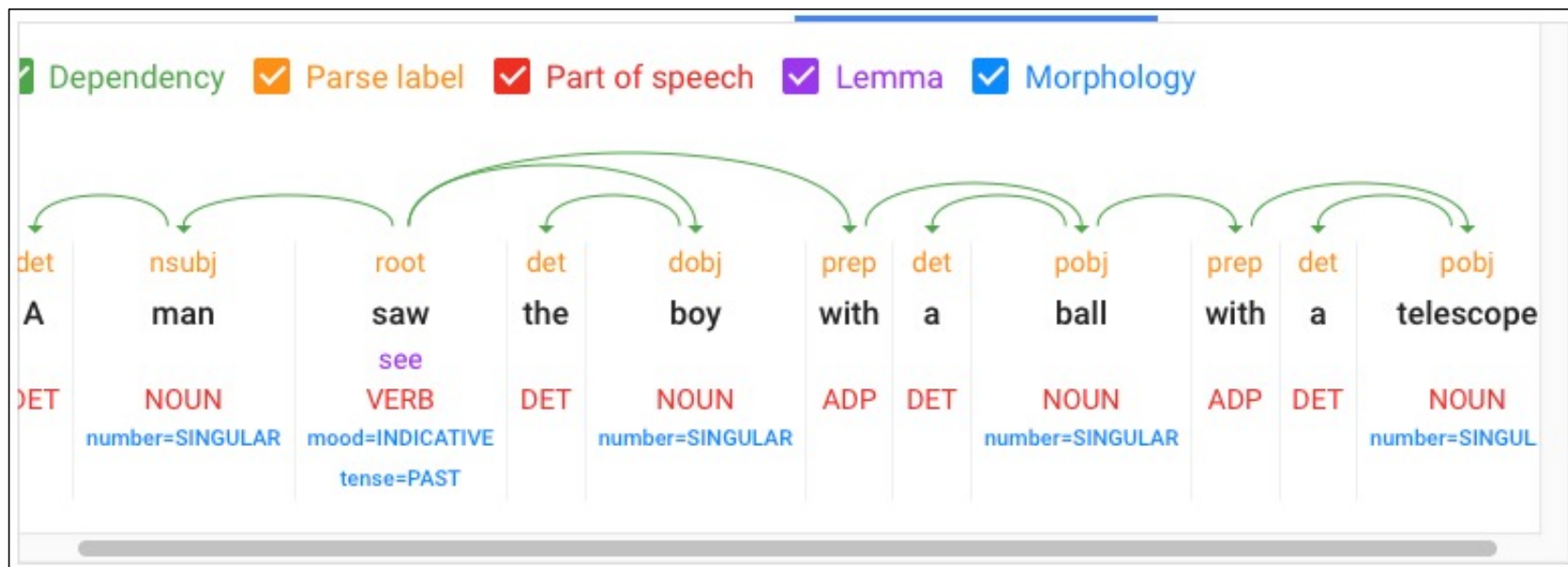
- <https://parser.kitaev.io>










What's the problem with this parse?

Homework 4 aside

<https://cloud.google.com/natural-language>






Homework 4 aside

SA	The man saw a boy with a telescope. Who has the telescope?	
	The boy has the telescope.	 
SA	The man saw a boy with a limp. Who is limping?	
	The boy is limping.	 

Homework 4 aside

- Stacking:

SA	The man saw a boy with a limp with a telescope. Who has the telescope?	
	The boy with a limp has the telescope.	 

ChatGPT and Anaphora Resolution

- Two examples from (Reuland 2011)¹
 1. Alice looked at the Queen. **She** was angry. (pg4)

¹Reuland, E., *Anaphora and Language Design* (2011), MIT Press.

ChatGPT and Anaphora Resolution

- Alice looked at the Queen. **She** was angry. (pg4)

SA

Alice looked at the Queen. She was angry. Can you tell me who was angry?



Alice was looking at the Queen and the Queen was angry.

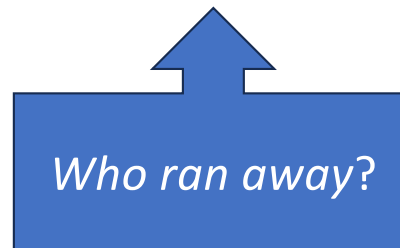
ChatGPT and Anaphora Resolution

- Two examples from (Reuland 2011)¹

1. Alice looked at the Queen. **She** was angry. (pg4)

2. The **white rabbit** jumped from behind the bushes. (pg26)

The **animal** looked around and then **he** ran away to avoid the angry queen.



¹Reuland, E., *Anaphora and Language Design* (2011), MIT Press.

ChatGPT and Anaphora Resolution

The **white rabbit** jumped from behind the bushes. (Reuland 2011: 26)
The **animal** looked around and then **he** ran away to avoid the angry queen.

SA

The white rabbit jumped from behind the bushes. The animal looked around and then he ran away to avoid the angry queen. Can you tell me who ran away?



The white rabbit ran away to avoid the angry queen.

ChatGPT and Anaphora Resolution

The **white rabbit** jumped from behind the bushes. (Reuland 2011: 26)
The **animal** looked around and then **he** ran away to avoid the angry queen.

SA

The white rabbit jumped from behind the bushes. The animal looked around and then he ran away to avoid the angry queen. How many animals are there?



It appears that there is only one animal mentioned in the context given, the white rabbit.



the expressions *the white rabbit*, *the animal*. and *he* easily receive the same value. For *he*, for instance, a reading where it gets the same value as *the animal/the white rabbit* is highly preferred.

ChatGPT and Anaphora Resolution

- Let's modify the 2nd example a bit:
 - The **animal** was looking around nervously. Suddenly the **white rabbit** jumped from behind the bushes.
- and ask:



The screenshot shows a chat interface with two messages. The first message is from a user, indicated by a grey square icon with 'SA' inside. The text of the message is: "The animal was looking around nervously. Suddenly the white rabbit jumped from behind the bushes. How many animals are there?". The second message is from ChatGPT, indicated by a green square icon with the OpenAI logo. The text of the response is: "It appears that there is only one animal mentioned in the context given, the white rabbit." To the right of the response are two small icons: a thumbs-up and a thumbs-down.

Here *the rabbit* is preferred to have a value different from *the animal*.

ChatGPT and Control Verbs

- Choice:

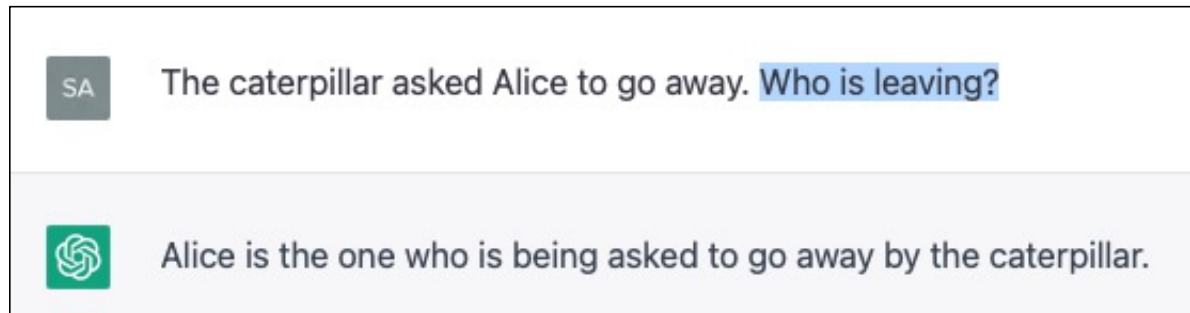
- X **promised** Y [PRO to do something]
- X **ordered** Y [PRO to do something]
- PRO is the subject of the non-finite clause (*to do something*)

what grammatical knowledge about the difference in verb meanings do we have?

- *promise* is a subject control verb (PRO = X)
- *order* is an object control verb (PRO = Y)

ChatGPT and Control Verbs


- Example (*object control verb*):
 - The caterpillar asked Alice [PRO to go away]. (Reuland 2011: 45)






The screenshot shows a chat interface with two messages. The first message is from a user, indicated by a grey square icon with the letters 'SA' in white. The text of the message is 'The caterpillar asked Alice to go away. Who is leaving?'. The phrase 'Who is leaving?' is highlighted in light blue. The second message is from ChatGPT, indicated by a green square icon with a white knot-like logo. The text of the response is 'Alice is the one who is being asked to go away by the caterpillar.'

ChatGPT and Control Verbs



- Example (*subject control verb*):
 - The caterpillar promised Alice [PRO to go away].




 SA The caterpillar promised Alice to go away. **Who is leaving?**

 It's not specified in the given context, but it can be inferred that the caterpillar is the one leaving, as he promised Alice to go away.  

ChatGPT and Control Verbs


- Example (*object control verb*):
 - The caterpillar **ordered** Alice [PRO to go away].


 SA The caterpillar ordered Alice to go away. Who is going? 

 In the sentence "The caterpillar ordered Alice to go away," it can be inferred that Alice is the one who is going. The caterpillar is giving an order for Alice to leave or go away.  

ChatGPT and Control Verbs

- Example (*object control verb*):
 - The caterpillar **ordered** Alice [PRO to go away].

 SA The caterpillar ordered Alice to go away. Who is leaving?

 It is not specified in the sentence who is leaving. The sentence states that the caterpillar ordered Alice to go away, but it does not say whether Alice or the caterpillar is the one leaving. 👍 🗨

Doesn't work in this case!

Asking the right question is key

ChatGPT and Anaphora Resolution

 **The Independent** ✓
1 h · 🌐

Apollo 11 astronaut said that he and his new wife are 'as excited as eloping teenagers'



independent.co.uk
Buzz Aldrin marries girlfriend Anca Faur on 93rd birthday


SA Buzz Aldrin marries girlfriend Anca Faur on 93rd birthday. Who turned 93?

 Buzz Aldrin turned 93.

SA Buzz Aldrin marries girlfriend Anca Faur on her 93rd birthday. Who turned 93?

 Anca Faur turned 93.

SA Buzz Aldrin marries girlfriend Anca Faur on their 93rd birthday. Who turned 93?

 Both Buzz Aldrin and Anca Faur turned 93.

Homework 4 Questions?

- `n13.prolog` was modified live in class:
 - `s(s(NP, VP)) --> np(NP), vp(VP).`
 - `np(np(DET, NN)) --> det(DET, NUM), nn(NN, NUM).`
 - `det(dt(the), sg) --> [the].`
 - `det(dt(the), pl) --> [the].`
 - `det(dt(a), sg) --> [a].`
 - `nn(nn(man), sg) --> [man].`
 - `nn(nn(men), pl) --> [men].`
 - `nn(nn(ball), sg) --> [ball].`
 - `vp(vp(VTR, NP)) --> vtr(VTR), np(NP).`
 - `vtr(vbd(kick_ed)) --> [kicked].`
 - `vtr(vbd(hit_ed)) --> [hit].`
- That modified grammar is the source for the homework.
- I called it last lecture `n15.prolog`

n15.prolog (*last time*)

Live programming

- Let's add to n13.prolog so we can parse:
 - *John saw the boy with a telescope*
- Need to add:
 - verb (VBD): *saw* – *past tense (-ed)*
 - preposition (IN): *with*
 - singular nouns (NN): *telescope, boy, limp*
 - proper noun (NNP): *john ('John'), mary* – *initial caps = variable*
- Need to add:
 - PP attachment to NP and VP rules

Homework 4 Questions?