

# Syntax and Interpretation

CSC485/2501

Lecture 7


# Announcement

- A1 Grade Released!
- Median: 80.53%
- If you are sure that there's an error in our marking  
Submit your remark requests (on MarkUs) within 7 days  
(Next Monday)
- A2 Extension Requests: send email

# Topics

- Stop talking about transformers and neural models for now
- Parsing & Building Grammar -> A3
  - Statistical Parsing
  - Unsupervised Parsing
- Question Answering, Prompt Engineering, & a bit of post-training
  - “Classic QA”: still an integral part of RAG
  - RAG, Chain of thought...
- Anaphora Resolution

# Goal of Parsing

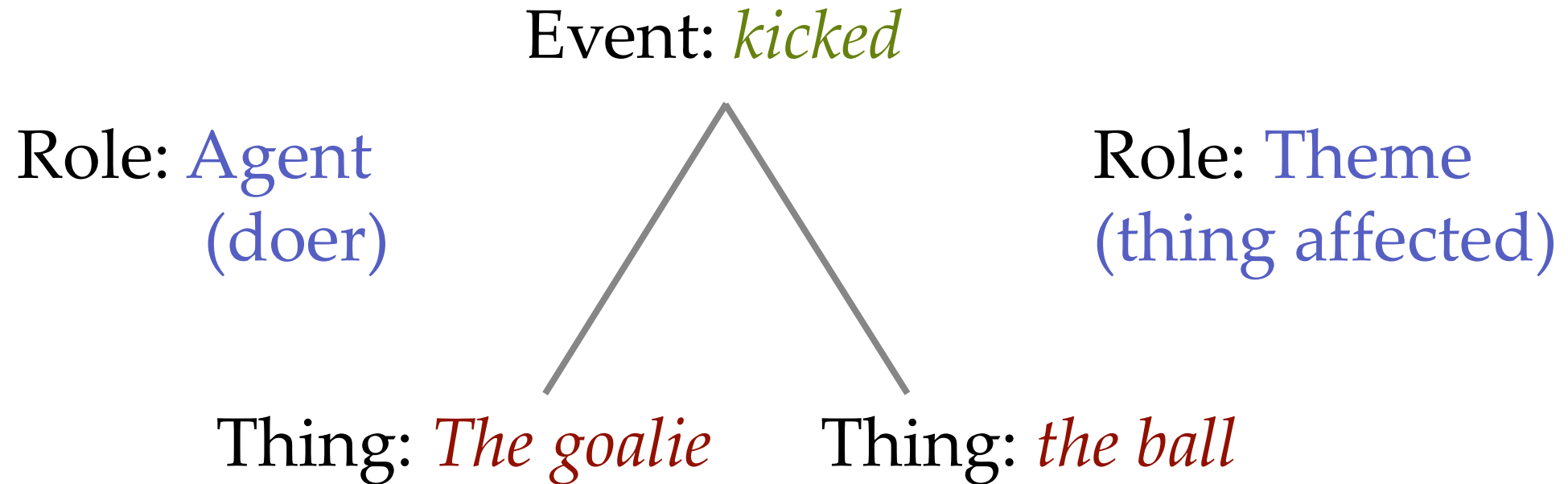
- A representation of properties relevant to meaning and interpretation:
  - Things
  - Predicates (events)
  - Roles

**Entities** (e.g., in a knowledge base)

**Relations** between things and predicates.
- Syntactic structure helps in:
  - Determining things and predicates.
  - Determining mapping of things to roles of predicates.




Example:

*The goalie kicked the ball.*



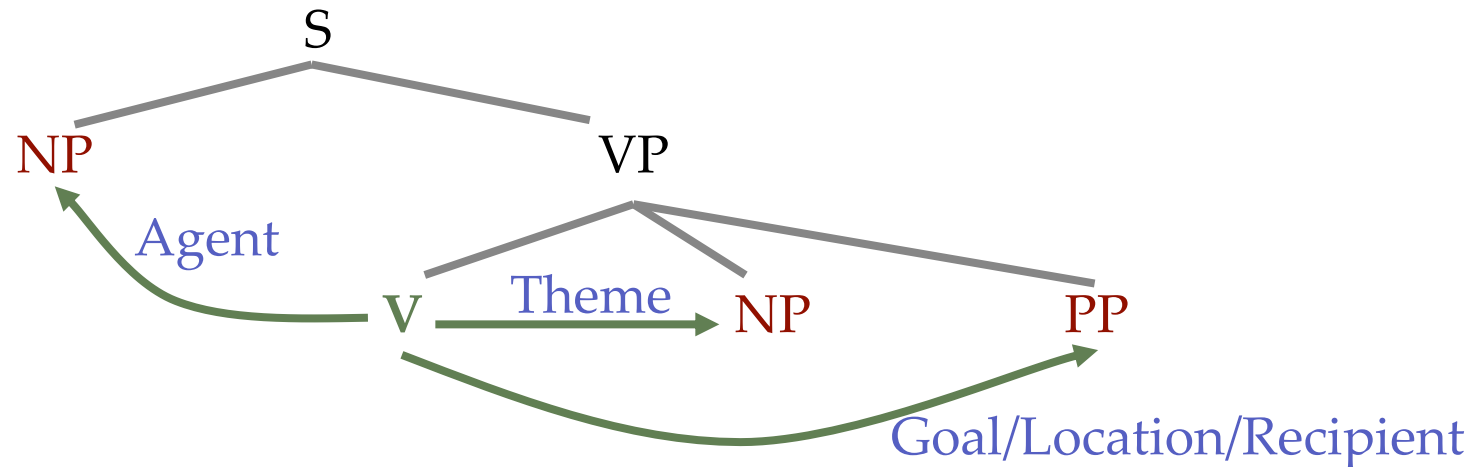
kick (agent=goalie, theme=ball)

# Syntax $\leftrightarrow$ Interpretation

- Mapping from structure to objects of interpretation
  - Things: NPs, Clauses...
  - Predicates: verbs, preps, APs...
  - Roles: ?? (**thematic roles**)
- **Thematic Roles:**  
*Mediates the relation between verbs with its arguments.*
  - The llama slept.  
  
*Theme*
  - The racoon devoured the doughnut.  
  
*Agent* *Patient*
  - Some students gave the professors a book.  
  
*Agent* *Beneficiary* *Theme*

# Syntax $\leftrightarrow$ Interpretation

- Parse trees more or less indicate grammatical function:
- Subject  $\approx$  Agent  
Object  $\approx$  Theme  
Object of preposition  $\approx$  Goal/Location/Recipient



- This mapping is used to determine appropriate semantic representation.

# Case vs. Grammatical function vs. Thematic role

- Mapping from case to grammatical function is entirely regular (in English, but not 1-to-1):
  - She introduced me to him.      I introduced him to her.
  - ラマは犬に本を渡す。
  - Das Lama gibt dem Hund das Buch.
- Mapping from grammatical function to thematic role is more or less regular:
  - Subject  $\approx$  Agent / Experiencer
  - Object  $\approx$  Theme
  - Object of preposition  $\approx$  Goal/Location/
  - Recipient / Instrument
- The latter mapping is used to determine appropriate semantic representation.



# Verb subcategorization (subcat)

- **Problem:** Constraints on individual verbs and their complements not at all regular.
- Eat vs. devour vs. dine.

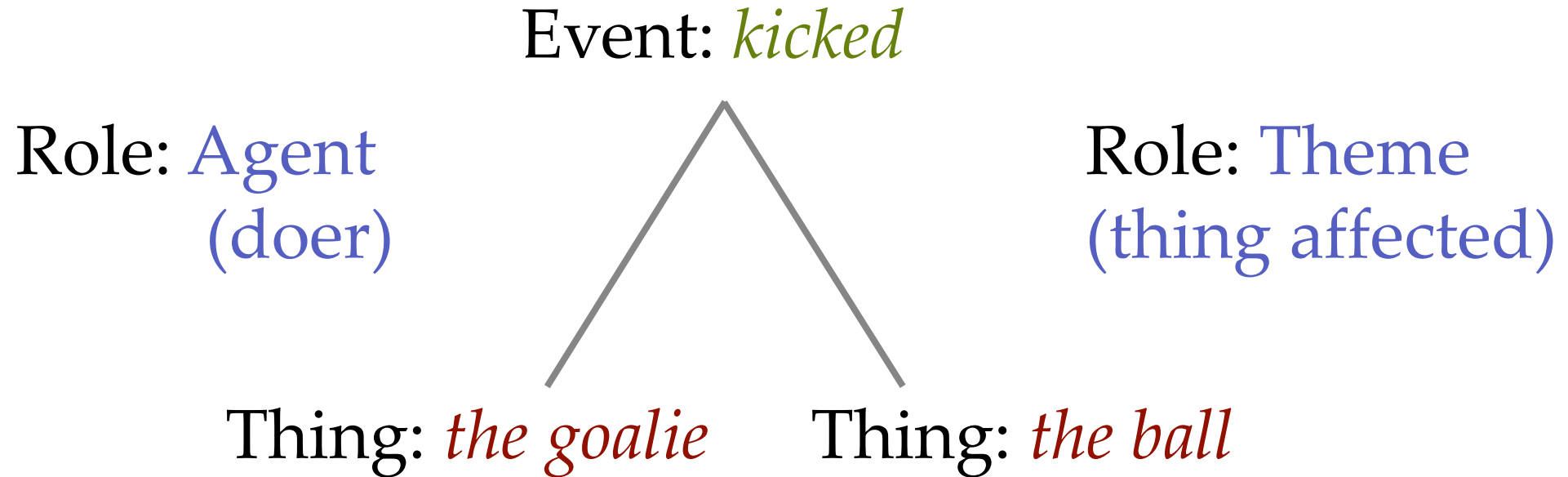
	eat	devour	Dine
subj V	Those llamas eat.	Those llamas devour.	Those llamas dine.
subj V obj	Those llamas eat the apple.	Those llamas devour the apple.	Those llamas dine the apple.
subj V on obj	Those llamas eat on the apple.	Those llamas devour on the apple	Those llamas dine on the apple.

- We will return to this later...

# Diathesis

aka voice: the relationship between the verb and its arguments.

*The goalie kicked the ball.*



kick (agent=goalie, theme=ball)

**Diathesis** aka voice: the relationship between the verb and its arguments.

*The ball was kicked.*

Event: *kicked*

Role: Theme  
(thing affected)

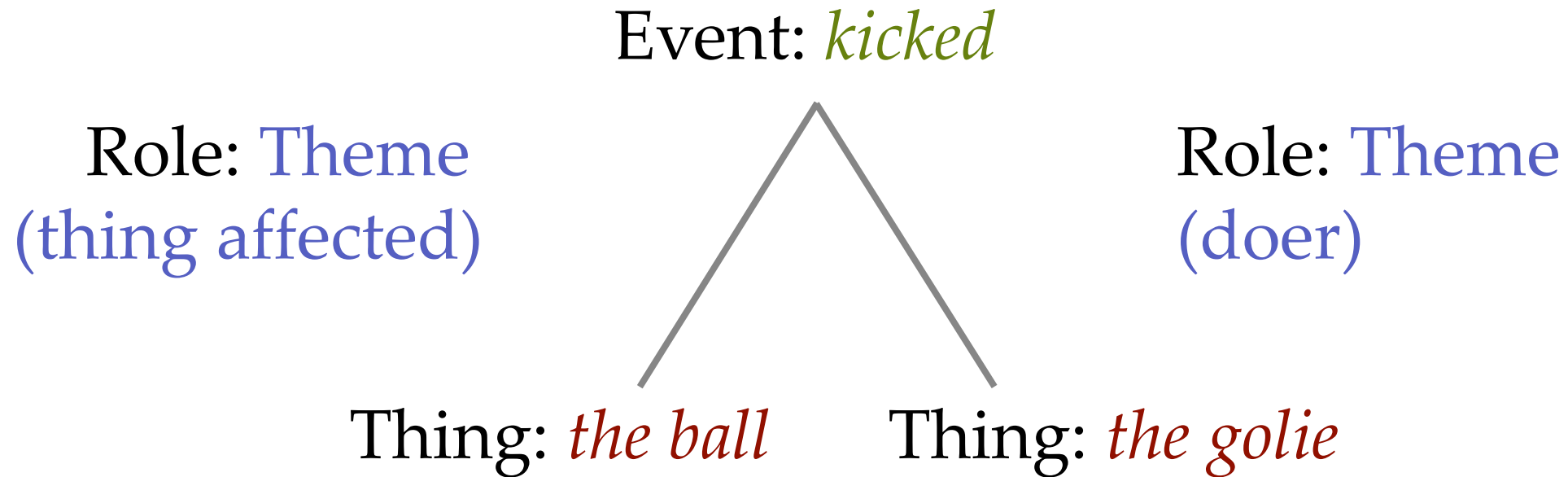
Thing: *the ball*

kick (agent=?, theme=ball)

# Diathesis

aka voice: the relationship between the verb and its arguments.

*The ball was kicked by the goalie.*



kick (agent=goalie, theme=ball)

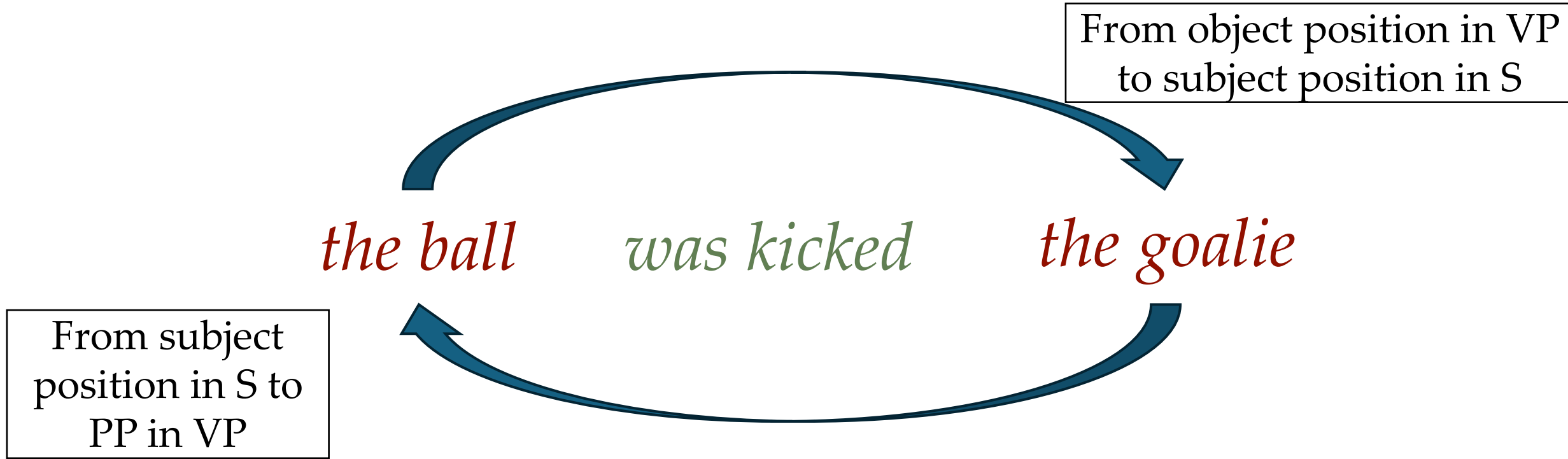
# Diathetic alternation

*the goalie*      *kicked*      *the ball*

# Diathetic alternation

*the ball*      *was kicked*      *the goalie*

# Diathetic alternation



But the semantic representation doesn't change