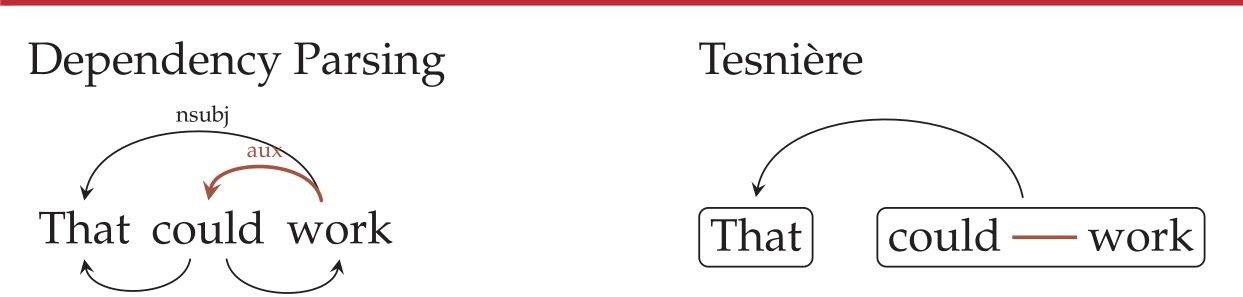


## What Should/Do/Can LSTMs Learn When Parsing Auxiliary Verb Constructions?

## Miryam de Lhoneux, Sara Stymne and Joakim Nivre



## Auxiliary Verb Constructions (AVCs)

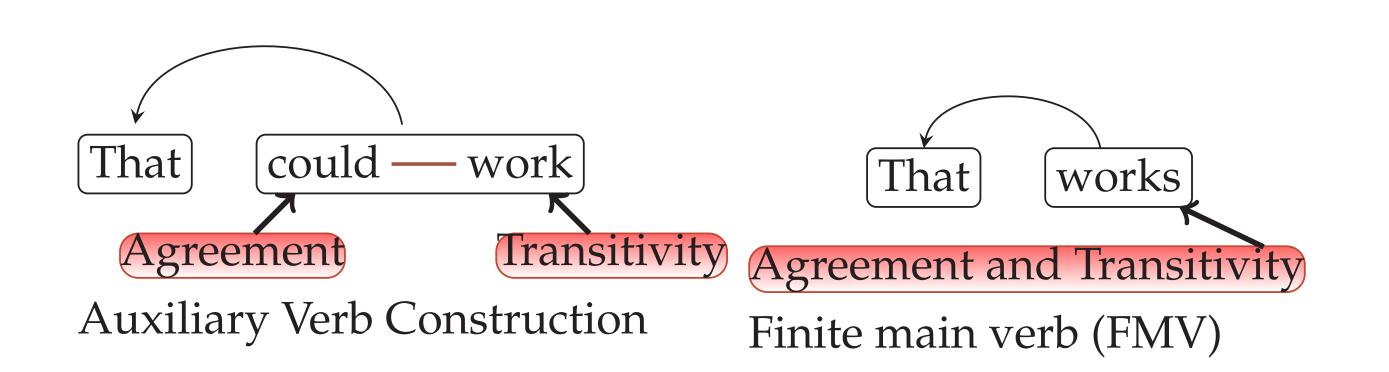


|                     | parsing    | Tesnière                |
|---------------------|------------|-------------------------|
| Unit of syntax      | words      | nucleus                 |
| Relations btw units | dependency | dep, transfer, junction |

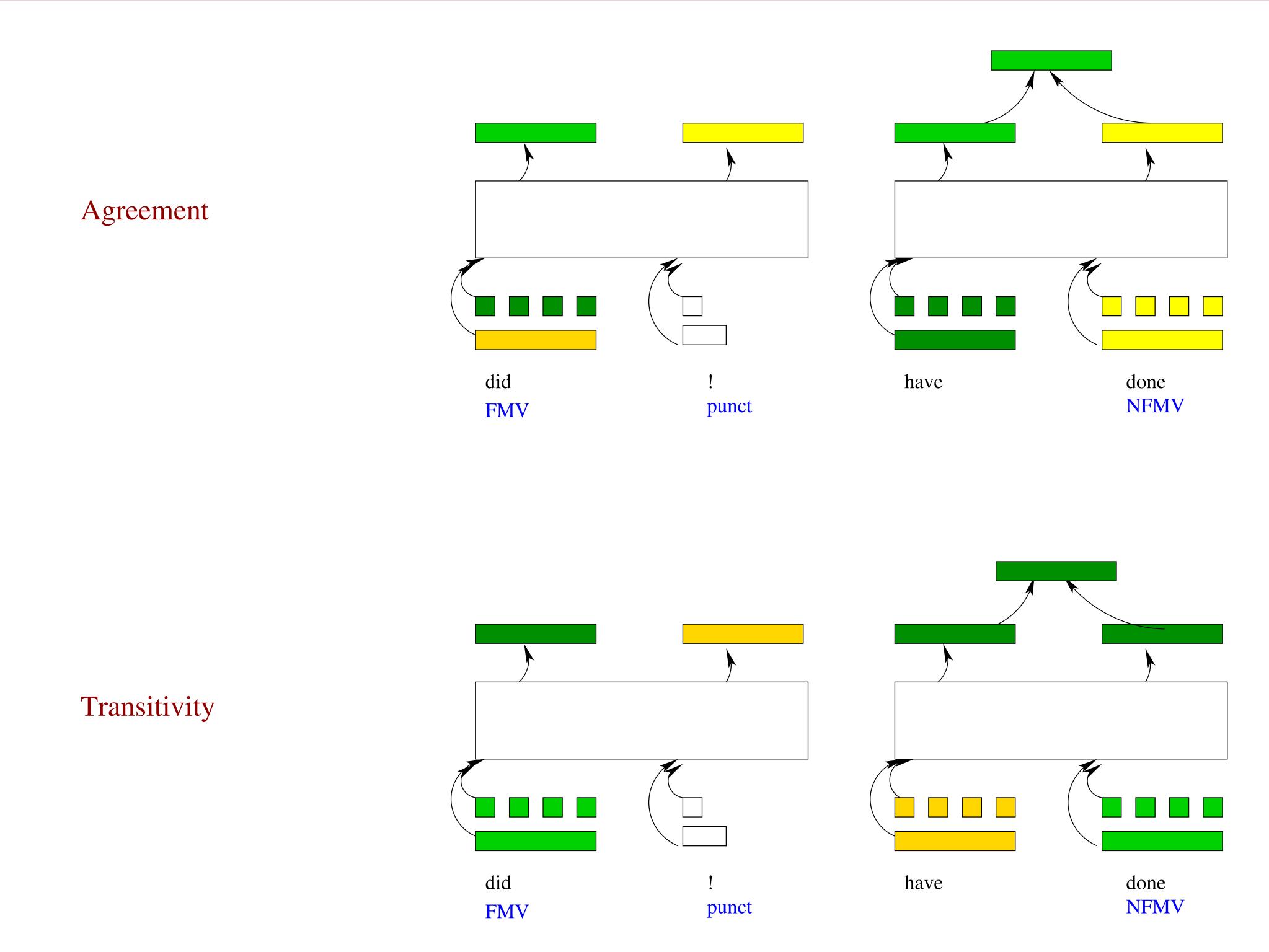
### Contributions

- We theoretically motivate that a parser **should** learn the notion of dissociated nucleus.
- We develop a methodology to test this for AVCs using diagnostic classifiers.
- We find that a BiLSTM parser does not learn this notion.
- We find that can learn it this if it is augmented with a tree layer.

## Diagnostic classifiers



# Experiments



#### Dataset

|   |          | FMV   |     | punct |     | AVC   |     |
|---|----------|-------|-----|-------|-----|-------|-----|
|   |          | train | dev | train | dev | train | dev |
| T | Catalan  | 14K   | 2K  | 7K    | 964 | 12K   | 2K  |
|   | Croatian | 6K    | 803 | 4K    | 491 | 5K    | 653 |
|   | Dutch    | 9K    | 618 | 6K    | 516 | 5K    | 251 |
|   | Finnish  | 12K   | 1K  | 9K    | 1K  | 4K    | 458 |
| A | Catalan  | 14K   | 2K  | 7K    | 964 | 12K   | 2K  |
|   | Croatian | 6K    | 803 | 4K    | 491 | 5K    | 653 |
|   | Dutch    | 9K    | 618 | 6K    | 516 | 5K    | 246 |
|   | Finnish  | 10K   | 1K  | 8K    | 850 | 4K    | 443 |